THE
# ELECTRICAL REVIEW

Volume CXXVII. No. 3270

Friday, July 26th, 1940

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THE
# ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXXVII. No. 3270 JULY 26, 1940 Price SIXPENCE

# Trade With South America

## New Factors in the Situation

THE turn of events in Europe and the Mediterranean has necessarily led to a revision of views regarding export trade. We can still hope that the Dominions will continue to look to this country for the bulk of their electrical requirements; in peacetime about 70 per cent. of our electrical exports went to Empire countries. Indeed, the increasing industrialisation of the Dominions to meet war needs and our greater purchases from them should result in a greater volume of trade.

While we must still rely upon the Empire for the absorption of the greater part of our electrical exports, there are other countries to which we may look for improved markets, and the most important of these are in the Western Hemisphere. For many years we have been stressing the opportunities which the South American countries offer as importers of electrical equipment. Much has been done by some British manufacturers but much has been left undone.

### Studying the Markets

By means fair or foul—very largely the former it must be admitted—other European exporters secured a strong hold upon the South American markets. The methods adopted were based upon a closer study of the position than many British manufacturers have troubled to make. Lists were produced in the language of the country being dealt with, dimensions were given in familiar units, prices were quoted in the native currency, and, above all, designs were adapted, or special ones were produced, to meet the ideas and pockets of the customers.

We refer particularly to "pockets," for cost, very largely due to fine quality, has been the chief handicap to the selling of British goods in these and other markets. As at home, we have got to descend from our pedestal and produce appliances which will do their job without being too massive in construction or too highly finished.

The Germans were particularly active in meeting the requirements of their South American customers or in persuading them that German standards were what they needed. We must follow their practice thus far, now that the opportunity presents itself, and secure a firmer footing. The absence of Germany from the markets means that a substantial volume of supplies which formerly came from that country now has to be obtained from other sources. It is worth while to indicate briefly the extent and nature of those supplies.

Argentina, for instance, took about 20 per cent. of her requirements from Germany in the form of electrical accessories, meters, conduit (in all of which she was the largest supplier), cables, generators and motors. Great Britain's share of the trade was always below Germany's. Most of the motors, generators and transformers purchased by Brazil went from Germany, in addition to substantial quantities of cable. In the latter the United Kingdom has done well, but in recent years there have been exchange difficulties. In this market lower British prices are considered essential by the British Commercial Counsellor in Rio.

Chile is a smaller buyer of electrical equipment; the bulk of the trade has been divided between the United States and Germany. The United Kingdom's share in 1938 was about one-eighth of the total of £430,000. In Peru and Mexico, while the United States has been the leading provider of electrical goods, Germany has secured a far more substantial share than this country.

### Recent Developments

A growth of interest in the possibilities of South America is apparent here. We announced a week or two ago that the British Standards Institution, in conjunction with the British Council, was producing a handbook in Spanish dealing with British industrial practice which was the forerunner of a series covering individual industries. At the same time a number of private ventures have been brought to our notice. We have so far heard only one criticism of these efforts; it is that little account is taken of Brazil. Practically all the literature is in Spanish, while Brazil employs Portuguese.

It is perhaps too early to attempt to assess the possible effects of this week's Pan-American Conference upon the prospects for British manufacturers. The agenda included a proposal that the United States and the South and Central American countries should form a kind of economic *bloc* and that the United States should take over the surpluses of commodities which the loss of European markets has left on the hands of the South American States.

This must inevitably mean a strengthening of the

hold which the United States already has on Latin American trade, but we can only hope that it will not act detrimentally to us. In the meantime encouragement may be drawn from the latest Board of Trade returns, which show that our exports to South America are being maintained at the high level reached during the earlier months of this year.

**Third War Budget**

IN the interim Budget presented on Tuesday the Chancellor of the Exchequer (Sir Kingsley Wood) relies chiefly upon increases in the "staple lines"—income tax (raised to 8s. 6d.), surtax, estate duty, beer, wine and tobacco, and entertainment tax. An innovation which should circumvent evasion and speed up collection is the decision to have income tax deducted at the source. The "half standard rate" of tax is to be 5s. As was anticipated, the Chancellor announced the withdrawal of the Purchase Tax Bill now before the House which makes little discrimination between luxuries and necessities. To take its place he has devised a scheme by which non-essential commodities will be subject to a levy of one-third of the wholesale prices; on other goods the tax will be one-sixth. There are a number of exempted "commodities," electricity being one of them. Household goods generally will be subject to the lower rate, but until complete details are available it is not possible to say whether all electrical domestic appliances will fall into this section. If the Limitation of Supplies Order is taken as a guide, certain items will be considered non-essential, but we shall know later.

**Emergency Fuel Control**

THE new Order giving the Secretary for Mines power to regulate the consumption of coal, gas and electricity in emergency, to which we refer in our "Commercial and Industrial" section, apparently applies to all domestic and commercial establishments as well as to small industrial undertakings, i.e., those which had a fuel consumption equivalent to 100 tons of coal or less in the year ended June 30th, 1939. The definition of "regulated premises" in the Order is exactly the same as that of "controlled premises" in the Fuel and Lighting Order, 1939, that introduced the rationing scheme which was later suspended. It might be thought that the new Order superseded the Fuel and Lighting Order, but we are assured by the Mines Department that this is not the case. The powers will be exercised only in serious emergency, and will generally be confined to particular areas and not applied nationally.

**Generation in New Zealand**

THE advanced stage of electrical development in New Zealand, which includes what is probably the most comprehensive rural system in the world, has been brought about in spite of a low average population density and paucity of large power-consuming industries. This is due largely to wise exploitation of the country's water resources, which provide all but 1 per cent. of the electricity used, although a number of steam and Diesel plants are retained as stand-by. That water power will continue to furnish the main supply of energy is the view expressed in "The Making of New Zealand, No. 13," a copy of which has been sent us by Mr. M. Cable, chief electrical engineer, Wellington Corporation Tramways and Electricity Departments. Some modification in present policy is, however, anticipated as good sites for hydro stations become fewer and more remote from consuming centres, and it seems likely that more fuel-fired stations will be constructed locally where coal and condensing water are available for dealing with seasonal peaks and emergencies. The lower first cost of thermal stations is in their favour for intermittent work, and the proposal is in conformity with the general principle that it is uneconomic to transmit peak-load energy for considerable distances. It seems probable, too, that the "peaks" may be extended over an appreciable time, since one of the factors influencing the situation is given as the lower operation costs now obtainable by means of high steam pressures and temperatures.

**Sequential Switching**

IN short-circuit tests on synchronous machines the three phases are usually regarded as being closed simultaneously. This does not always happen, and a brief time lag in making contact in the third phase may appreciably affect the interpretation of the tests. An analysis of a series of tests on several sizes of machines of this type, which appears in the *General Electric Review* for June, shows, among other things, that only the asymmetrical components of the short-circuit armature current are affected by sequential switching, and that peak transient currents may considerably exceed the maximum values possible when all phases are made at the same instant. These considerations are of importance when determining values of reactance.

**The N.J.B. Schedule**

WHEN we reproduced the new scale of salaries for power station engineers in our issue of July 5th, we mentioned that a revised version of the Schedule of 1923 embodying the Supplemental Schedule of 1935 and subsequent amendments was being produced. We have now received a copy of the new document from the National Joint Board of Employers and Members of Staff for the Electricity Supply Industry. All concerned will be pleased that it has at last been possible to complete this work; it will make the task of the officials of both the employers' and the staff sides much easier, particularly as an index has now been provided. The paper restrictions have precluded the wide circulation of the booklet, and so the earlier schedules should still be retained for reference.

**Electrified Fences**

THE use of inexpensive live-wire single-strand fences to restrict the movements of farm stock is on the increase owing to scarcity of timber, as recent articles and correspondence in *The Farmer & Stock-Breeder* have indicated. The practice, the advantages of which are confirmed by investigations made by the Ministry of Agriculture, has proved to be quite safe, provided the installations are designed and carried out by people with the necessary experience. In the United States, however, fatal accidents to human beings as well as to animals have resulted from the crude nature of the home-made devices often used. This has caused the introduction of new regulations (U.S. National Bureau of Standards Handbook H 36) which prohibit the energising of any fence (whether from a battery, transformer or by induction or capacity discharges) except through an approved controller, and limits the charging voltage to 15 as a maximum. In Great Britain, 6V in conjunction with an induction coil, making and breaking several times a minute, has been found to do all that is necessary. Provided no danger or public nuisance is caused, the question of legality does not arise.

**Modified Street Lighting**

IN our last issue we quoted a statement from the *I.M.E.A. Journal* that at least 50,000 modified street lighting units had already been ordered by local authorities. The British Standards Institution, which has the task of certifying these fittings for compliance with the appropriate Standard Specification, tells us that this gives a misleading impression of the position. It may have meant, of course, that these fittings were additional to those which have already been installed, but we are assured that the total number ordered since the units were introduced is in the neighbourhood of 200,000.

**Nothing but the Truth**

A PARAGRAPH in a Yorkshire paper reporting a net surplus of £3,532 on the Keighley Corporation electricity undertaking, with a statement that in spite of increased costs no increase has been made in charges, appears under the heading "Anti-Rumour Week."

# REFRIGERATOR MOTORS

## Design of Types for Domestic Apparatus

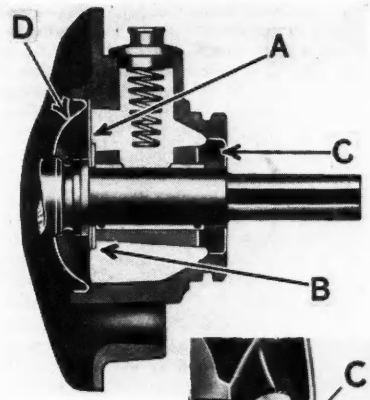
By S. F. Philpott, A.M.I.E.E.

THE principle of operation of the domestic refrigerator is that refrigerant vapour is compressed after it has absorbed heat from the cooling chamber and is then passed into a condenser where heat is withdrawn and it becomes a liquid. As a liquid it enters the expansion chamber in the cooling space where it expands into gaseous form again and in doing so absorbs heat from the food. The refrigerant (gas) is then drawn into the compressor on its suction stroke.

**Mr. Philpott is with the General Electric Co., Ltd.**

The motor driving the compressor is switched on and off thermostatically as required to maintain the set temperature in the cooling space. The frequency of operation of the motor and the duration of each running period depend on the capacity of the cooling chamber, the volume of its contents, the set temperature inside the cabinet, the room temperature, the general design and construction of the apparatus and on the way the refrigerator is used, e.g., how frequently the chamber door is opened.

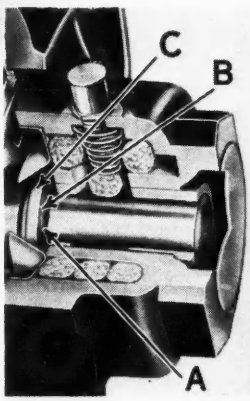
The rating of the motor depends on the capacity of the refrigerator, and in this country is usually ¼ HP. Compound-wound motors are used for DC circuits, while the capacitor-start induction motor has now largely supplanted the repulsion-start induction-run motor which was extensively used for single-phase AC supplies up to a few years ago. The motor speed is of the order of 1,440 RMP (i.e., a four-pole winding in the case of AC machines).




**(1) B.T.H. bearing**

Conditions of operation are so variable that the motors are generally designed for continuous duty. Starting conditions are often severe, as not only must the motor be capable of starting against full compressor load, but also when the compressor bearings are stiff, particularly if the machine has not operated for some time. Generally the motor must be capable of exerting a starting torque of up to 400 per cent. of its normal running torque and to get away quickly and silently. Silence and absence of vibration are most important factors in the design of a refrigerator unit, especially as it operates by night as well as by day. The achievement of silence is made more difficult by the housing of the modern refrigerator in a steel cabinet, which may act as a sound box, and also with single-phase induction models, by the inherent vibration due to the pulsating torque produced in running, as opposed to the continuous torque of polyphase and DC motors.

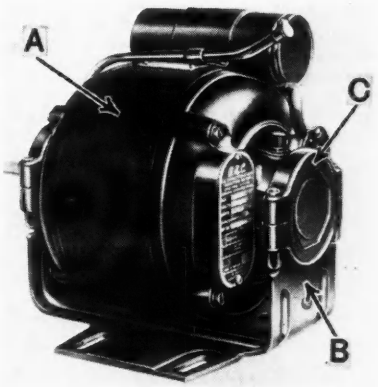
Rotors and armatures are invariably dynamically balanced; static balancing (on parallel strips) has been found to be not good enough.




**(2) G.E.C. arrangement**

Refrigerators must continue to operate silently for years, sometimes without lubrication, or occasionally with over-lubrication with, perhaps, unsuitable oil. Bearing slackness readily sets up noise, particularly in AC motors, and plain bush bearings, being quieter in running than ball bearings, are invariably used. In addition to the solid turned phosphor-bronze bush, bearings are often made from sheet steel faced with white metal and wrapped into a cylinder.

It is fairly standard practice to-day to grind and lap all shafts, and to diamond-bore the bearing bushes after assembly in their brackets. This ensures a mirror-like surface inside the bush, the bore diameter of which is truly concentric with the spigot of the end bracket. This in turn ensures concentricity of the rotor with the stator bore.



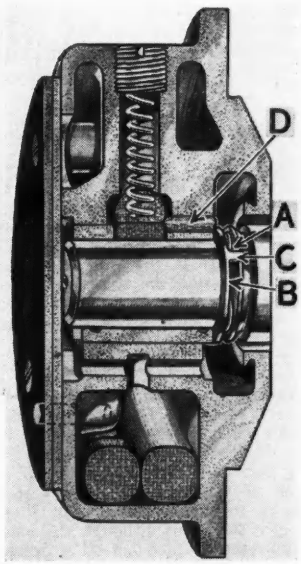

**Typical AC refrigerator motor (G.E.C.). The motor A is supported on base B but is insulated from it by the rubber bushes C fitted over the motor bearing housings**

The lubrication system most favoured to-day is that in which an oil-soaked wick or wool yarn packing is pressed by a spring into contact with the shaft through a hole in the casting and bearing bush. The packing holds sufficient oil for a long period of service without attention, and oil can be added when required through an oil cup.

The bearing arrangement illustrated (1) has an anti end bumping device consisting of a steel spring diaphragm A and a cushioning washer B, which together effectively damp out any noise due to the shaft bumping against the end of the bearing bush. Covers C and D effectively seal the housing against oil leakage.

Another well-known bearing (illus. 3) contains, in addition to an oil-soaked wick, a reserve of free oil. The bearing is unspillable and is guaranteed to run continuously for two years with the original factory filling of oil.

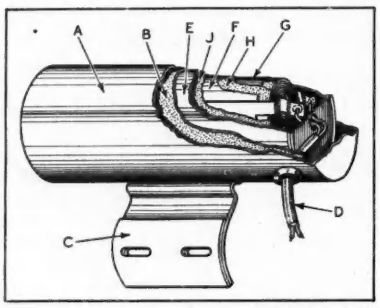
The end thrust is taken upon a dished spring steel washer A retained by the washer B which is driven from the shaft through tongues C. A separate wick feed D lubricates the thrust washers. In a further make (illus. 2) noise due to shaft "bumping" is prevented by fitting a washer B of cork-like material between an enclosing dished washer C and planished steel thrust washers A.




**(3) Crompton "Marathon"**

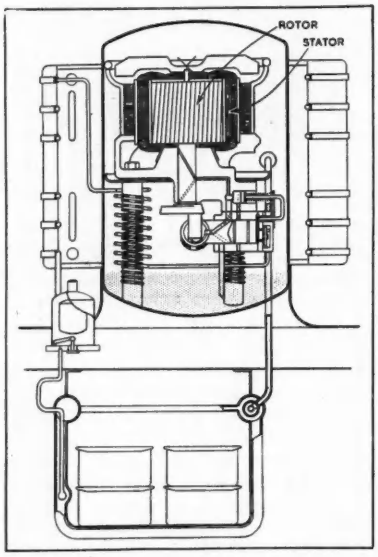
Usually the motor is also acoustically insulated from its base by some form of resilient mounting such as rubber bushes fitted over the motor-bearing housings. The motor casing, rubber bushes and clamps are designed so that the motor cannot rotate or move endwise.

When the drive to the compressor is by means of a "V" rubber belt, a spring tightening device is sometimes embodied in the mounting. This is so arranged that the reactive torque of the motor, *i.e.*, the tendency for the stator and motor casing to turn in the opposite direction to the rotor, is added to the belt tension produced by the spring. The result is that at starting the reactive torque, and the belt tension are both greatest, thus eliminating any tendency to slip.



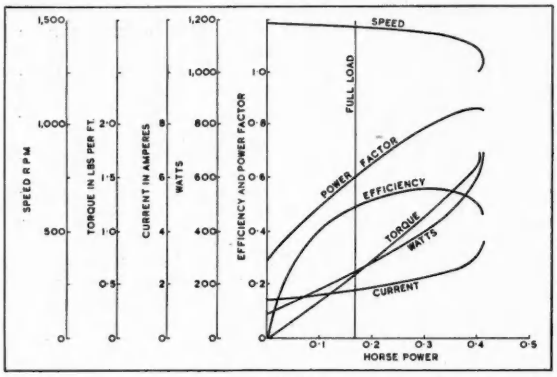

**Internal construction of electrolytic condenser as fitted to refrigerator motor (Dubilier)**

The demands of the refrigerator market have largely contributed to the resuscitation of the capacitor-start split-phase squirrel-cage motor, which has become economical to manufacture only with the comparatively recent development of the electrolytic condenser. The capacitor-start type has greater starting torque, takes less starting current and is more silent than the ordinary split-phase motor. It has two stator windings connected in parallel across the mains, one is the main or running winding and the other the auxiliary or starting winding which is in series with a condenser and has its poles midway between those of the running winding. An automatic switch opens the starting winding as soon as full speed is attained. The automatic switch may operate either by the increase in centrifugal force on a rotating member as the speed increases, or magnetically by the decrease in current as the motor runs up to speed. The centrifugal switch is the more generally used. The difference in phase created between the two stator windings causes the motor to start under approximately two-phase conditions.




**Sectional view of B.T.H. sealed refrigerator unit**

A condenser of the order of 30 $\mu$F is required for a 230-V, 50-cycle $\frac{1}{6}$ HP motor; with paper dielectric it would be bulky and expensive, but on account of the brief time in which it is in circuit the electrolytic condenser has been found to be suitable. In the illustration of the internal construction of a condenser of this type, A is the outer can, which is insulated from the condenser proper contained in an inner can E, by a liner B; C is the flange for mounting on the motor, and D the connecting lead. F is the negative condenser foil of thin pure aluminium and G the positive foil. Both are "formed" to give a thin layer of oxide, which is actually the dielectric on all surfaces. Between the two foils is a separator H impregnated with electrolyte. The foils and separator are made in strip form and are rolled up to fit into the can. J is a wrapping insulating the condenser foil from the inner can. The single-phase capacitor motor does not cause radio interference, and no suppressor is therefore necessary.




**Performance curves of 1/6-HP capacitor-start motor, 220/230-V, 50 cycles**

An overload protection device is frequently built into a refrigerator motor. Two types of overload must be taken into account—one where the motor is running normally, with only the running winding in circuit, but overloaded, and the other where a great starting effort prolongs the starting period so that the starting winding and condenser, designed to be in circuit for a very short time only, are liable to be damaged.

In one form of thermostatic overload release a bimetal disc carries two contacts which are firmly closed at normal temperatures. Beneath the disc is a small heater coil. The whole is contained in a bakelite case which is fitted inside the motor. The disc and heater carry the main current of the motor. If the starting period is prolonged the heat produced by the coil causes the bimetal disc to be deflected and to open the contacts with a snap action. If the motor cannot start at all, the heat produced is greater and the motor is switched off more quickly. When the motor is overloaded, after normal starting, the abnormal heat from the motor itself causes the disc to deflect and open the circuit.

# Manx Bulk Supply Charges

LAST week the hearing was opened at Castletown, of a Chancery Court action in which the petitioners are the Isle of Man Electricity Board and the respondents the Douglas Corporation. The Board is asking for a declaration of the rights and liabilities of the Board and the Corporation under Section 9 of the Isle of Man Electric Light and Power Act, 1932, which imposes on the Corporation the obligation to sell to the Board as much electricity as it requires. It also provides that if the price for the electricity is not agreed upon between the parties it is to be computed in accordance with the rules contained in the Second Schedule to the Act. No agreement as to price has been made.

Mr. G. E. Moore (representing the Board), in opening the case, said that for about three years the Board had felt dissatisfied with the charges which it had been asked to pay, but efforts to reach an agreement for varying the charges had failed. In 1935 the Board purchased approximately 23 per cent. of the kWh generated at the Corporation's power station, and this proposition had risen to slightly more than 40 per cent. in 1939, and further since then, but although the Board was taking an increasing supply the charges instead of decreasing were rising. It was contended that this was due to the fact that the Corporation had incurred heavy capital expenditure on the undertaking which the Board considered to be quite unnecessary. The plant had a capacity of 11,955 kW while the maximum load recorded at any time had been only 4,431 kW.

The Board claimed that the Corporation had not obtained the sanction of the Governor to any capital expenditure attributable to the Board's demands on the Corporation, and therefore the Board was not responsible for any of the payments mentioned in the Second Schedule to the Act for monies borrowed by the Corporation for the purposes of the undertaking.

The Corporation maintained that the Governor's approval had been obtained because all borrowings for capital expenditure had been sanctioned only after full inquiry by the Local Government Board and after the approval of the Tynwald had been obtained. The signature of the Lieutenant-Governor was placed on all borrowing petitions when granted. It was also claimed that the Board, through its chairman, had approved of the expenditure. The Corporation further stated that it had invited the Board to submit all matters in dispute to arbitration, but the Board refused. It claimed that the Board was not entitled to the declaration asked for and that it must proceed by arbitration.

In reply the Board contended that the signature of the Governor did not indicate approval within the meaning of the Act, and that when its chairman voted for approving the Corporation's petition to borrow money for the undertaking he did so in discharge of his duty as a member of the Legislature, and it did not bind the Board in any way.

After evidence by Mr. W. H. Karrant (secretary to the Local Government Board) and Mr. J. R. Corrin (chairman of the I.O.M. Electricity Board) the hearing was adjourned until Wednesday of this week.

# PULVERISED-FUEL FURNACES

## Recent Operating Experience in America

By V. Walker, A.M.I.E.E.

OPERATING results of ten representative pulverised-fuel boilers, installed during the past three years, are given in a report by the Prime Movers Committee of the Edison Electric Co. for 1939. In most cases the working pressure is between 1,300 and 1,400 lb. per sq. in., and steam temperature between 815 and 975 deg. F., the capacity ranging from 300,000 to 1,000,000 lb. per hr. Service availability averaged 80 per cent. of the total time. As most of the boilers have been in service for only one year and redesign and reconstruction have occasioned extensive outages, the availability factor will no doubt increase.

One of the most frequent causes of outage is the cleaning from boiler surfaces of slag which cannot be removed by the usual methods during operation. This occurs to the greatest extent with slag-tap units, owing to higher temperatures in the combustion zone and other sections of the furnace. Slag is generally removed by mechanical blowers using steam and/or water. Deslaggers and wall cleaning units, introduced during the last three years, are an addition to standard soot blower elements. Steam pressures as high as 350 lb. per sq. in. at the soot blower heads may be required, especially where the blowers cover the superheater. Hand lances employing steam, water and, most commonly, air are frequently used.

### Slag Accumulation on Tubes

Slag on the furnace tubes reduces heat absorption, causing high gas temperatures and often excessive superheat. As the slag builds up on the water walls more of the gases are by-passed round the superheater, but without considerable mechanical cleaning or hand lancing the superheater by-pass is often unable to control the steam temperatures adequately.

Slagging of the superheater may entail taking the boilers off load. As the tube passages become choked, the gas flow concentrates in the less clogged passages, the temperature of those fouled by fly ash often being considerably lower than the relatively cleaner elements. This condition also produces a blow-torch effect which causes overheating and failure of tubes, but is alleviated by providing wider tube spacing.

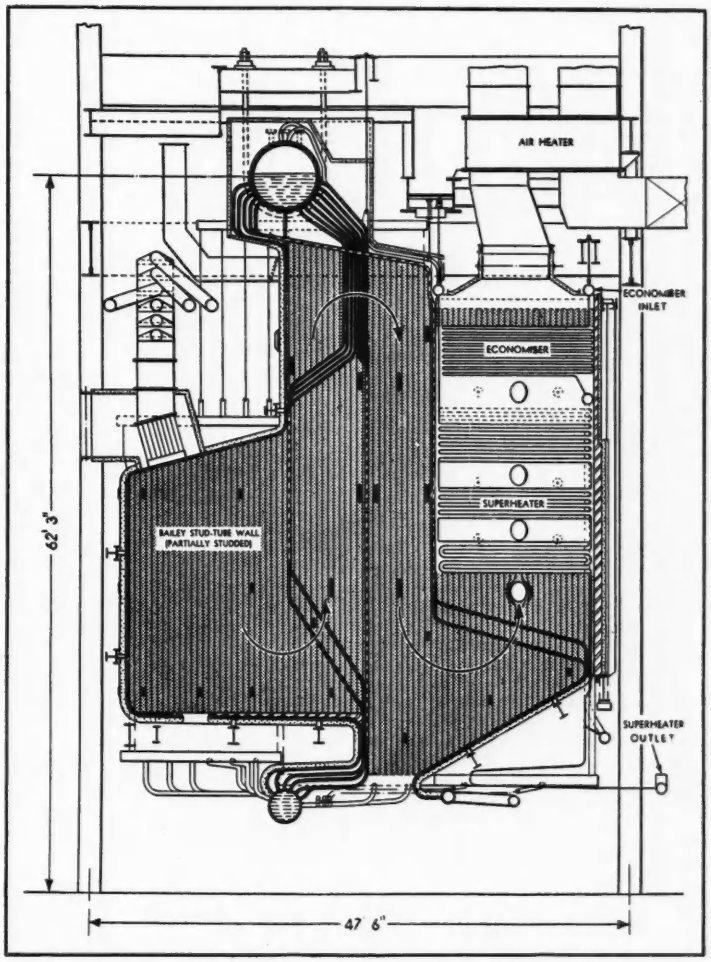
Pulverised-coal burners, usually of the tangential or intertube design, cause little trouble except for coking at the burner tips and in the conduit piping. Unequal distribution of coal to several burners supplied by one mill has also resulted in poor combustion and furnace pulsations. Coking in the piping has been overcome by installing corrugated liners and by cooling the burner nozzles immediately a pulveriser is shut down. Coking is often caused by the streams of coal and air being too thinly divided at the burner. Regulating the distribution of coal by designing the conduit with equal pressure drops is not always successful and special deflectors or control dampers checked by coal sampling and draught observations have been employed.

Tangential corner firing provides higher temperatures in the combustion zone and heat absorption rates 20-25 per cent. more than do horizontal turbulent burners; there is less tendency for the gases to move in parallel lanes and load conditions can be adjusted by cutting out burners without affecting symmetry of burning.

General practice is to maintain minimum fuel-air ratio in order to keep combustion temperatures as high as possible. At lower boiler ratings, however, an excess of air is required to maintain uniform steam temperatures. At the Logan station, where the twin three-drum bent-tube boiler has a capacity of 1,000,000 lb. per hr., a very low $CO_2$ has to be maintained in the furnace at about 700,000 lb. per hr. in order to prevent blocking of the superheater with slag. This low $CO_2$ condition has caused difficulties in operating the induced draught fans owing to the large quantities of gas dealt with compared with full-load operation.

Excess air readings taken at the outlet of the boiler include air leakage through the ash pit and setting, so the amount of excess air used for combustion is not recorded. Generally, either recording $CO_2$ or Bailey steam-air flow meters are used as a guide in setting the fuel-air ratio, but as these instruments are set by Orsat determinations made at the boiler outlet, the operator must be guided by the appearance of the furnace or stack. Tests on a two-stage furnace parallel-flow unit showed the excess air delivered with the fuel at the primary furnace outlet to be approximately 8 per cent. at full capacity with simultaneous indications of 17 to 20 per cent. at the boiler outlet.

Measurements have been made of the wear of grinding elements of B. & W. ball-bearing pulverisers, Type E, 110 of which have been installed or contracted for (52 for central stations) after pulverising 20,000 and 27,000 tons of coal. These tests indicated that the life of these parts will be equivalent to approximately 142,000 and 150,000 tons respectively. Tests on a 9.25-ton unit at Edgar Street, Boston, at full capacity gave a power consumption of 9 kWh per ton with 86 per cent. through 200 mesh and 99 per cent. through 50 mesh with coal of 92 grindability.




**Section through B. & W. 1,450 lb. per sq. in., 935 deg. F., 600,000 lb. per hr. open-pass boiler for the Chester station of the Philadelphia Electric Co.**

High and controlled superheat temperatures and high steaming capacities have made boiler and furnace design far more of an integral problem than formerly, resulting in radically new approaches as shown by the radiant and open-pass boilers (see ELECTRICAL REVIEW, July 15th, 1938, and January 5th, 1940). A primary furnace performs the functions of a hot combustion zone (which is essential for satisfactory slag tapping) independently of other portions of the furnace. The proportion of heat absorbed in the furnace and tube bank before reaching the superheater is of increasing importance in attaining controlled high superheat.

Ash-fusion temperature considerably affects the rate of heat absorption, the ash from some coals having a much higher fusion temperature range, as actually deposited on furnace walls, than is normally determined by present methods. This may be detrimental in certain conditions and advantageous in

others. As the total heat absorbed in the furnace is a function of the exposed water-cooled surface, the common practice of comparing performance on the basis of BThU per cu. ft. of furnace volume does not provide a true criterion. The basis should be BThU released and absorbed per sq. ft. of projected radiant surface.

Development work continues in the direction of shading the convection-heating surface from tthe radiant heat of the combustion zone and long paths of flame or gas travel with consequent high velocities over the radiant absorbing surfaces. Radiant boilers provide these characteristics to a greater extent than do open furnaces or even two-stage high-head furnaces. In the open-pass boiler, long-flame travel is accomplished economically without undue furnace height by utilising as radiant-heat absorbing surface both sides of the water-cooled division walls of the open passes.

Trouble with furnace-floor tubes has been caused by overheating and poor circulation with both slag-top and dry-bottom furnaces. With slag-top furnaces the covering of the floor with a heavy layer of chrome ore, which is retained by brickwork, has been the most effective antidote. Another method is to fit a water-cooled ring round the spout over which the slag flows from the furnace bottom, thus preventing the slag entering the slag pit by flowing over the floor tubes. In order to reduce internal corrosion of the floor tubes, 3½-in. o.d. tubes with a slope of 1 in. to the ft. have been replaced by 3-in. o.d. tubes with a slope of 1½ in. to the ft., thus accelerating circulation through the lower portion of the boiler. Helical cores have also been installed in the floor tubes to increase the wetted perimeter, thus eliminating dry spots at the top of the tubes where the heat input is high.

Leakage of tube seats at the lower water-wall headers of dry-bottom furnaces has been overcome by rerolling and seal welding and placing a 2-in. layer of carbofrax refractory at the furnace side of the headers to reduce heat input in the region of the tube seats.

# Information for Contractors

## Difficulty of Keeping Up to Date

### By E. Arthur Pinto, A.M.I.E.E.

THE electrical contractor who would keep himself abreast of progress in his section of the industry frequently finds himself at a loss to know how and where to gather the required knowledge. The type of information which the would-be up-to-date contractor is likely to be seeking may be divided broadly under two heads: (1) Apparatus, materials or working methods, both new and in the form of improvements to existing types; (2) the technical and practical considerations involved in their utilisation.

To some extent information under (1) is obtainable through trade channels, *e.g.*, from travellers, catalogues and business notes in the Trade Press. Often, however, this information is too meagre to be of general application and is not in such a form as to be readily available for future reference, that obtained from salesmen being verbal and the remainder being available only to the very few contractors who have a systematically classified collection of Press cuttings. One has in mind such introductions as fluorescent lamps, or discharge lamps generally, and also new or revised ideas in actual installation work, such as duct systems, fireproof cables and so on. On the first of these I collected every Press cutting and every manufacturer's publication which I could find, yet a lecture lasting less than an hour taught me more than the whole of this laboriously collected literature.

Another important and wide subject on which many contractors have hazy and often antiquated ideas is the vast variety of motors, the uses of each type, methods of control, regulation and so on. Full information on such a subject is available only to those few contractors who can afford to purchase and to keep up to date an expensive technical library and the still smaller number of them who have the time to study books. The great fault of most textbooks is that they are applicable to too many sections of the trade—designers, installers, repairers and users.

Under the second heading the sources of information are practically nil. Notes on these matters certainly appear from time to time in the Press, but too often these stress the designer's or the theoretical aspect rather than the commercial or practical viewpoint. Speaking generally, it is considered impolitic to discuss in the Press the purely financial aspect although this is all-important to the contractor.

### The I.E.E.'s Part

Many reputable contractors are not members of the Institution of Electrical Engineers for various reasons, and if the I.E.E. really wishes to represent electrical engineering it should recognise more readily that the better contractors are electrical engineers. There will still remain the large body of contractors whose past training and responsibilities do not quite qualify them for membership of the I.E.E., but who should, in the interests of the whole industry, have all available sources of knowledge concerning their work placed within their reach. Owing to the many sides of the profession or industry covered by the I.E.E., it is understandable that there may often be a period of years between the reading of papers especially of interest to contractors, as such, and even in these the discussions are apt to be too academic and high-brow to appeal to the average contractor. The proposed Installation Section might go far towards remedying this shortcoming, but it is doubtful if it would be altogether successful, partly because the commercial or financial side would, apparently, still be taboo.

The Informal Meetings of the I.E.E. are more useful, but the limitations of membership, infrequency of discussions on any particular side of the profession, and the very few centres at which they are held detract greatly from their value. Their very informality, welcome and pleasing as it is, is to some extent their weakness, as the absence of any published reports renders them useless to those not actually present, and precludes any later references to outstanding points in the often very mixed opinions which are expressed.

Just as the I.E.E. purports to cater for electrical engineers generally, so is the Electrical Contractors' Association very jealous of its function as the contractor's own and only organisation. Surely, therefore, it is here that he should be able to obtain all the information he may desire. It is true that if any member puts up a technical question to the E.C.A. the secretary will obtain for him a prompt and authoritative reply. This, however, savours rather of the "Answers to Correspondents" column, and the information goes only to the individual asking for it. Technical matters are practically absent from the topics discussed at E.C.A. meetings. At the last Conference a collection of papers, extraordinarily valuable to the practical contractor, was presented. They were read in summary and hurried form, and the discussion was absurdly curtailed and lost much of its force by being almost a combined treatment of three widely divergent subjects. In spite of these drawbacks, the papers met with such a unanimous chorus of approval as to leave no room for doubt that this is one of the services which members look for. Had these papers been read and discussed at separate meetings, one cause of bad attendances would have been eliminated.

### A.S.E.E. Meeting

The Association of Supervising Electrical Engineers, amongst its many activities, organises lectures, demonstrations and discussions on many subjects which are of direct interest to everyone engaged in the contracting industry. Many contractors have attended these functions, but they are naturally loth to take unlimited advantage of hospitality—which is both technical and practical—without being able to return it.

There is thus a real gap in the contracting industry's organisation which no existing body can fill by its own efforts. To fill the void without adding to the already multitudinous array of professional and trade organisations, I would suggest that a small joint committee of E.C.A. and A.S.E.E. members should form the nucleus of a "Joint Technical Progress Committee," which would organise lectures, papers, formal and informal discussions, and so on, to take place wherever either of these Associations has a branch or section. Papers could be invited from, amongst others: (a) Association members who have made a study of some particular branch of the industry; (b) consulting engineers; (c) supply authorities', consumers' or installation engineers; (d) manufacturers who have something new or interesting to put forward.

Bodies such as the Illuminating Engineering Society, the Association of Consulting Engineers and others might be invited to appoint representatives on the committee which, if composed of the right men, might become a valuable force not only in its immediate purpose of affording information to the contracting industry, but also indirectly benefiting the industry as a whole. Finance would not be a matter of much difficulty, as the work would be merely an extension of that of the branches of the associations already in existence.

## A Large Mercury Lamp Searchlight

A SEARCHLIGHT giving 25 million beam candle-power which has been recently erected in New York uses three 1,000-W capillary mercury-vapour lamps mounted together in a standard fitting. According to the *Electrical World*, the lamp efficiency is 65 lumens per watt. Cooling water (90 gal. per hr.) pumped through jackets surrounding the lamps removes more than 85 per cent. of the energy as heat. The three-phase 208-V supply is stepped up through individual high-reactance transformers (with built-in capacitors for power-factor correction) to 1,200 V to start and 870 V to operate the lamps.

# THOUGHTS ON SELLING

## Electricity Cheaper Than Coal

**By H. Southall**

*(Commercial Assistant, Watford Electricity Department)*

IT is frequently said that electricity chiefs know and care very little about the selling branch of the business. This may be true in a few isolated instances, but there are men who, earlier in their lives, were connected with the manufacture and sale of gas and oil engines who could testify to the selling ability displayed by many electrical chiefs. Also, there are some towns which have cause to be grateful for the industries attracted to them by the sale of electricity at venturesome rates through the efforts of many electrical chiefs in the pioneer days. Too many people are prone to think that the supply industry, like Topsy, "just growed."

Shortly after the last war the possibilities of big business in the domestic sphere became apparent, and some undertakings made courageous efforts to develop this class of business. Some of the methods used proved sound and successful, others bore signs of misconception; the results varied accordingly. Many of the schemes would have resulted in driving undertakings to the verge of ruin had it not been for the vast increase in the sale of energy at lighting rates which resulted from the building boom between 1924 and 1936.

Occasionally there has been evidence of further drifting away from the fundamental object of applying salesmanship in the industry. That object is, and must remain, the sale of increasing quantities of electricity at low margins of profit by methods which keep consumers satisfied.

Up to a short time ago it was fashionable to publish figures showing the growth in the sale of lampshades and other frills in showrooms. Undertakings vied with each other in announcing the numbers of appliances which they had succeeded in hiring and selling to their consumers. Some went further by flaunting the numbers of cookers they had succeeded in inducing their consumers to accept for nothing.

These items have their place in a properly conducted selling concern, but they should be kept in their proper place, which is secondary to the sale of electricity. Only on rare occasions were figures published showing the annual growth in the average sale of electricity to consumers using domestic tariffs.

### Local Factors

Local customs cannot be ignored when selling schemes are being devised, and success cannot be achieved by blindly following the methods or rates of hire introduced by another undertaking in a distant part of the country, and it does not follow that an appliance having a special appeal in one area must be marketable on the same scale elsewhere.

It is too much to expect business in wash-boilers and washing machines to thrive in towns where laundries abound and prosper, and it is altogether wrong to ignore these appliances in towns where it is possible to see thousands of lines of household washing on Monday mornings. Some Northern towns can produce impressive figures under the heading of immersion heaters, whereas in the South, where builders seem to provide a solid fuel boiler in every home, large or small, there must always be a reluctance on the part of the public to obtain their hot water in any other way. On the other hand, electric cooking appears to be more popular in the South than in the North; it does not follow that salesmen and demonstrators in the North are less enterprising—the price of gas has a lot to do with it.

These comments aim at showing the futility of undertakings, geographically far apart, expending their efforts in attempting to emulate the appliance records of each other. Undue ambitions in this direction are the parents of some of the uneconomic selling schemes which are in vogue even to-day. It is a dangerous practice to pursue a policy in any business comprising a number of different "lines" which allows one "line" to be sold regardless of production, delivery and selling costs. Often enough the fact that it is sold at an uneconomic price increases its sale disproportionately to the profitable lines and unless great care is exercised the end is inevitable.

There are other factors to be considered when forming a sales policy for a specific district. Owing to the war economy is being urged upon all and forced upon many. In and around London household coal is being sold at prices which leave Northerners aghast. Anthracite and coke for use in solid fuel boilers are offered at prices which cause the hot baths of the buyers to cost something approaching the price usually charged by seaside landladies for these necessities. A few weeks ago great consternation was caused in thousands of homes by the non-appearance of the coalman and greater consternation was felt by those who had to pay the bills which followed his belated arrival.

If those concerned persist in making it difficult for the Southerner to keep warm the electricity supply industry cannot be blamed for taking full advantage of the position created. There is a considerable difference between Northern and Southern retail coal prices; the difference between the prices of steam-raising coal is much less.

This seems to suggest that freightage is not responsible for the Southerners' misfortune and Northerners now resident in the South can vouch that quality has nothing whatever to do with the difference. The moderation shown in the prices of steam-raising coal must have some effect in preventing cheap electricity being confined to the North. Salesmen and women should be able to sell electricity in competition with coal on price alone in the London area.

Some of those remaining on the sales staffs are growing despondent. Customers in the showrooms are dwindling in number and those who call are bringing lighter purses. It is unwise to transfer salespeople to clerical duties; they should be utilised as far as possible for the work in which they have been trained, but a little guidance may be necessary to meet present conditions.

None of the existing war orders or regulations prohibits efforts to meet domestic needs by means of steam-raising qualities of coal instead of household qualities. Even if life is restored to the moribund Fuel and Lighting Order it should not be difficult to secure the insertion of a more flexible "swapping" clause than that contained in the original Order. Many consumers would be delighted to "swap" a ton of household coal at sixty-five shillings for fourteen hundred kWh costing some fifty shillings if the matter was explained clearly to them. Any objection which the Mines Department had to the idea could perhaps be countered by pointing out that more expensive coal would be available for export.

There are many advantages to be gained from increasing the sale of electricity to existing consumers through existing apparatus. No capital expenditure is involved on the part of either the consumer or the undertaking and there is usually a capacity margin in substations and mains; were it not so electricity would be cheaper than it is. The mere mention of cheaper electricity at the present time may seem platitudinous to sellers and ironic to many buyers but even the war cannot alter the fact that increased sales do reduce costs.

Possibly the electricity supply industry may eventually be forced to give its attention to this aspect of modern business. The market for domestic electricity is still open and it is unlikely to close before every modern home is using a minimum of five thousand kWh per annum.

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## South African Blast Furnaces

THERE are two blast-furnace plants in South Africa; one at Pretoria of the S.A. Iron & Steel Industrial Corporation, Ltd., and the associated plant at Newcastle of the African Metals Corporation, Ltd.

Commenting on practical aspects of the management of such furnaces in a paper recently released by the Iron and Steel Institute of London, Mr. R. R. F. Walton describes briefly how the crushed ore and flux are handled at Pretoria by conveyors and electric transfer cars. The furnace charging is done with double skips, electrically driven on an inclined hoist, the electric scale-car driver operating the whole of the charging system.

Furnace gas for the stoves passes through plain and vortex dust catchers and then into a pre-cooler, whence it goes either to a Lodge-Cottrell electric cleaner, which is a three-unit two-stage plant, or into two tower washers followed by three Theisen disintegrators. The gas is cleaned to 0.007 grain of dust per cu. ft. The efficiency of the electrostatic precipitator depends on the temperature and humidity of the gas it has to treat. A thermostatic regulator governs the supply of water to the pre-coolers and to keep the thermostat bulb clean it is placed in the cool-gas main so as to be free from mud. Both pre-cooler and slat-tower sprays can be withdrawn individually and cleaned during operation, this being done each shift.

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## Help with Physical Problems

IN order to assist professional men who in the present emergency find themselves presented with technical problems in applied physics of which they have not had first-hand experience, the facilities of the Institute of Physics' panel of consultants are to be extended. Inquirers can be put into touch with those physicists most likely to be able to offer immediate practical suggestions in any particular branch of physics, pure or applied, including measurements and testing, design and supply of scientific instruments and control of processes. Further particulars may be obtained from the secretary, Institute of Physics, The University, Reading, Berks.

# INDIA'S HYDRO-ELECTRIC PROJECTS

## Assisting Industrial Development

NO comprehensive survey of India's available water powers has yet been completed, although a general review of the position was made some twenty years ago. It was then estimated that 1,750,000 HP could be developed from various sites exclusive of those on tributaries of the Indus. This figure should be regarded, in the light of subsequent investigation and technique in production, as conservative. Resources which have been surveyed and several which have since been actually developed indicate a considerably greater capacity.

In 1919 it was estimated that existing industries used something over 1,000,000 HP yearly and that of this amount slightly over one-quarter was in the form of electrical energy derived from coal, oil or water. These figures have since been greatly increased, particularly in the case of total demand and the proportion supplied in the form of electricity, but accurate data is unobtainable.

The coal deposits in Bengal and Chota Nagpur are of inestimable benefit to industries in those areas, but transport charges to western and southern parts of the country are high. It is therefore apparent that, whereas Calcutta and other cities and industrial districts in the low-lying parts of eastern India will continue to use steam power, the trend in many of the other industrialised areas will be towards hydro-electric power.

Hydro-electric development in India has been associated in several instances with irrigation projects. Water storage schemes to supply agricultural lands in dry seasons have been extended and improved to enable the flow to be converted into electrical energy without affecting the supply to agricultural areas. In some cases these plants cannot operate at full capacity during the year owing to insufficient water, but where possible they are being extended to permit of perennial use. In other instances power has been developed as an independent commercial enterprise, water storage facilities in the Bombay district having been developed to a point where all the larger steam plants have been shut down in favour of the cheaper hydro-electric power.

The first hydro-electric scheme in India was in Mysore State in 1902. A suitable site on the Cauvery River, which rises in the Western Ghats and flows across the State, was developed, and a large proportion of the output was carried 92 miles to the Kolar goldfields, where substantial reductions in costs were effected. For some years this development was the only one of the kind in India. The original plant has been improved until its capacity is now 46,000 HP. Electricity is distributed to the cities of Bangalore and Mysore, several hundred towns and villages, and a number of industrial concerns. Increasing demands from these and others have led to the surveying of two additional sites, and it is expected that these will shortly be developed, thus raising the State's electrical plant capacity to 89,000 HP.

The largest hydro-electric undertakings in India are those begun some 25 years ago in Bombay Province by Tata and Sons, Ltd., who saw the benefit of cheap power to Bombay's industries as well as the natural advantages of the lakes and elevation of the mountainous country of the Western Ghats. The first of these schemes, utilising the storage facilities of the lakes and providing 64,300 HP, was inaugurated in 1915. A second development on the Andhra River, which provides the same amount of power, was put into operation in 1922, while a third scheme on the Nila-Mula River, which has a capacity of 117,000 HP, was inaugurated in 1927.

Madras Province is second to Bombay for hydro-electric power. The Pykara scheme is based on supplies of water from the river of the same name in the Nilgiri district. The development, begun in 1932, was for some time dependent on an irregular flow, but the construction of additional reservoirs has removed these obstacles. The scheme provides some 60,000 HP, a large part of it going to the city and industries of Coimbatore. A second development, which began operation in 1937, was based on water storage primarily for irrigation, provided by the Mettur-Stanley dam, and is one of the plants which cannot operate at full capacity at all times owing to variations in the volume of water. Alterations are now under way and an output of 25,000 HP is expected shortly. Irregularity in output is overcome to some extent by co-ordination with the Pykara scheme and by the use of auxiliary steam equipment.

A third scheme is now under way, based on available water power reserves on the Tambraparni River in the Tinnivelly district which, when completed, will provide substantial additions to the two existing systems and, in association with them, will supply the bulk of the energy required in the Tinnivelly and Madura districts.

Of less importance but still significant are hydro-electric power schemes in the Punjab, the United Provinces and Kashmir. The Uhl River scheme in the Punjab, which is still being extended, furnishes power to Lahore, Amritsar, Ludhiana and Moghalpura. When completed, output is expected to reach 150,000 HP and to be available in all important districts in the Province. It will also tend to expand cultivatable areas by the extension of tube-well irrigation. The Ganges Canal hydro-electric scheme in the United Provinces is important as an aid to irrigation by means of power for the operation of pumps rather than as a supply of energy for industrial uses, but it still serves some 75 towns. The remaining development worth mentioning is on the Jhelum River in Kashmir State, some 20,000 HP is distributed in Baramulla, Srinagar, and to various State and industrial concerns.

Altogether the hydro-electric plants in operation, or under construction, provide 600,000 HP.

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# Correspondence

***Every letter must be accompanied by the writer's name and address preferably, but not necessarily, for publication. The Editors cannot accept responsibility for correspondents' opinions***

### Commutator Trouble

YOUR correspondent "Commutator" may find the following remarks helpful:

In the first place, if the dynamo is a shunt-interpole machine, it must be run as such, care being taken to see that the interpoles are connected in their proper order and have the same polarity as the preceding main coils in the direction of rotation. The object of these coils is to give sparkless commutation by correcting field distortion due to the armature and to give a fixed position for EMF reversal at the brushes. In a small-carcase machine with a fairly high amperage, the interpoles will play a leading part in keeping reactance voltage at the brushes at a minimum.

It is essential that the brush position be correctly determined when run at the correct speed on full load. The grade of brush is most important, and with undercut micas, a soft graphite brush can be used as there is no longer any necessity to use a hard mica-scouring brush. Brush position may need altering when changing to graphite brushes.

The speed should not be increased beyond the makers' instructions, as reactance voltage at the brushes would increase sparking. Blackening of the commutator bars and the number under the brush during commutation have a direct relation to the point in question. H. Y. FOWLER.

Liverpool, *July 15th.*

### Electric Gas Lighters

Your editorial note and the letter from Mr. A. Tubbs in your correspondence columns to-day recall and illustrate an electrical device that deserves to be restored to common use. As stated in the advertisement that you reproduce, this gas lighter was "never failing," and it was constructed on "the frictional induction principle." This may be interpreted as meaning that it produced what was then known as frictional electricity, requiring no battery, and that it was, in effect, a robust form of "replenisher," resembling in principle the charging device in the Kelvin electrometer.

When, in 1890-1892, Professor G. M. Minchin was experimenting at Cooper's Hill College, it was with this form of "gas lighter" that he often brought his impulsion cells into the sensitive state. For many months the action was a mystery to us. We were not yet "radio-minded." At last it dawned upon us, however, that the gas lighter was a Hertz oscillator and caused certain loose contacts in the photo-electric impulsion cells to cohere.

Among my treasures I have an example of the piston-and-quadrant mechanism forming the "drive" of one of these gas lighters. It was given to me by Mr. Sloper, the genius who did so much to perfect the motor tyre; he commended it as one of the most beautiful and effective instances of mechanical design to be found in an article of common use. I have not been fortunate enough to obtain an example of the whole device. ROLLO APPLEYARD.

London, W.2, *July 19th.*

### Terminology

Can any of your readers state why the term "potential transformer" has been superseded by the expression "voltage transformer" in the latest B.S.S. 81 for instrument transformers? Does not "potential" appear to be the most appropriate here? C. N.

*July 17th.*

# PERSONAL AND SOCIAL

## Information regarding new appointments and other matters of interest for this page are welcomed

THE new headquarters of the Brush Sports and Social Club was opened in Loughborough on July 20th by **Mr. T. B. Keep,** managing director of the Brush Electrical Engineering Co., Ltd., and president of the club. When Mr. Keep joined the Brush organisation one of his first concerns was the fostering of a good spirit in the Sports Club and the provision of a club house. The building in Fennel Street, near the centre of the town, was acquired by the Brush Co., and after extensive alterations it has been leased to the club. The several large apartments, tastefully decorated and furnished, include a fully licensed bar, billiard room, games room, lounges for men and women, skittle-alley and gynasium. The opening ceremony was well attended and the enthusiasm with which this interesting welfare development has been received by the members, who number over 3,000, augurs well for the future of the club.

**Mr. T. B. Keep, managing director of the Brush Electrical Engineering Co., Ltd., performing the opening ceremony of the company's sports and social club. Among those present are Mrs. Keep, Mr. H. E. Midgley (director) and Mr. L. G. Reid (general manager)**

**Mr. A. B. Read,** director of design with Troughton & Young, Ltd., has had the distinction of Royal Designer for Industry conferred upon him by the Royal Society of Arts. This distinction was created by the R.S.A. in 1937, to be awarded to those who had attained to eminence and efficiency in creative design in their various spheres in industry and it cannot be held at any time by more than forty men. The total at the moment is thirty. Mr. Read has contributed several articles to the ELECTRICAL REVIEW on lighting fittings design, and in 1932, in collaboration with Dr. J. W. T. Walsh, read a paper before the I.E.E. on "Electric Lighting of Buildings."

**Mr. A. B. Read**

**Sir Frederick Sykes** (National Conservative) is the new M.P. for Central Nottingham, there being no other nomination. Sir Frederick is a director of a number of companies, including the Associated Equipment Co., Atlas Electric and General Trust, Callender's Cable and Construction Co., Ltd., Callender's Trust, and G. D. Peters & Co.

Tributes to the services of **Mr. Edwin Seddon,** who retires next month from the position of joint manager of Edinburgh Corporation Electricity Department, were paid at a meeting of the Public Utilities Committee on July 19th. Councillor Banks, chairman, said that Mr. Seddon had been twenty-eight years in the service of the Corporation. He had done an enormous amount of work in reorganising the department and in connection with the building of the Portobello station. Mr. Seddon, in thanking the Committee, referred to the development of electricity supply in Edinburgh.

At the annual meeting of W. and T. Avery, Ltd., on Tuesday last, it was announced that **Sir J. Fortescue Flannery** had resigned the chairmanship of the company owing to failing health. **Mr. W. H. Turner** has succeeded him as chairman.

**Mr. C. Gearing** was married on July 9th at St. Pancras Church, Plymouth, to Frances Patricia Thomas, only daughter of Mr. and Mrs. C. A. Thomas, of Rio Tinto, Spain. Mr. Gearing has been Midland sales representative for the past six years with Berry's Electric, Ltd., and was previously at the London office of the company.

**Mr. R. Robertson,** LL.D., who, as reported in our last issue, has been appointed chairman of the Clyde Valley Electrical Power Co., and its associated companies, in succession to the late Mr. Charles Ker, LL.D., is an engineer by profession and a B.Sc. of Edinburgh University. He has been largely responsible for the planning and the technical developments of the company.

For some years he has been chairman of the governors of the Royal Technical College, Glasgow, and received the honorary degree of LL.D. from Glasgow University in 1935.

**Mr. W. E. Pratt** has been appointed manager of the Oriental Tube Co., Ltd., West Bromwich (proprietors: the G.E.C.), in succession to the late Mr. C. J. Sadler, who occupied that position for over twenty years until his death on June 26th. Mr. Pratt is a life-long resident of Birmingham. After serving in the Royal Engineers in the last war he joined the Oriental Tube Co., Ltd., and has been assistant manager of the works for the last two years.

**Mr. C. A. Gillin,** mains engineer with the Bradford Corporation Electricity Department, is retiring at the end of this month after forty-five years' service with the Department.

**Mr. J. W. Perkins,** of Bryce, Ltd., has been appointed sales manager to the Nevelin Electric Co., Ltd. He will, however, retain his connection with Bryce, Ltd.

**Mr. Campbell Murray,** M.I.E.E., M.Cons.E., consulting engineer, 122, Wellington Street, Glasgow, C.2, has taken over the practice of Walter Dixon & Co., consulting engineers, Blythswood Chambers, 261, West George Street, Glasgow, C.2, of which the late Mr. Frank Anslow was sole partner.

**Captain Vernon Ferens,** Adjutant D.L.I., and youngest son of Mrs. C. and the late Alderman H. E. Ferens, of Durham, is a prisoner of war in Germany. In civil life Captain Ferens is associated with F. Reid, Ferens & Co., Ltd., electrical contractors, Newcastle-on-Tyne. He was a Territorial officer before the outbreak of war.

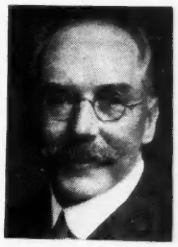
The Staff Committee of Fulham Corporation has recommended that **Mr. P. Briggs,** assistant mechanical maintenance engineer, shall be transferred to the position of assistant mechanical and electrical maintenance engineer with a commencing salary of £600 per annum, as provided for the third and fourth years of service in Grade 6 of the N.J.B. Schedule.

The wedding took place at Holy Trinity Church, Dartford, Kent, on July 20th of **Mr. J. W. Spencer Mather** and Miss Mary Dorcas Kerr. The bridegroom is assistant engineer for the South-East England Area, Central Electricity Board.

## Obituary

**Councillor J. H. Tonge.**—The death occurred on July 17th at the age of seventy-two of Councillor John Henry Tonge, vice-chairman of Preston Corporation Finance Committee. Councillor Tonge was the first engineer and manager of the old National Electric Supply Co. and continued in office when the undertaking was acquired by Preston Corporation in April, 1922, until he retired the following December. Shortly afterwards he set up in practice as a consulting electrical engineer. He had been a member of the Town Council since 1934, and had also served on the Mid-Lancashire Electricity Advisory Board.

**Mr. P. J. Sims.**—The death occurred at his home in Glasgow on July 17th of Mr. Percy J. Sims, who was in his sixty-ninth year. Mr. Sims was for forty-four years in Scotland in the service of the General Electric Co., Ltd. He was appointed manager of the company's Glasgow branch in 1910, and under his supervision branches were subsequently established at Edinburgh, Aberdeen, Dundee and Inverness. He retired owing to failing health early in 1937. The interment took place at Cathcart Cemetery on July 19th and followed a service at St. Margaret's Church, Glasgow, attended by a large representation of the electrical trade in Scotland.



**The late Mr. P. J. Sims**

## Uranium as a Power Source

WHEN uranium is bombarded by slow-moving neutrons about three additional neutrons are given off for each fissure so created. This indicates a regenerative quality within the element that should permit continued or chain reactions without further outside influence. Instead, however, the neutrons thrown off are found to be immediately absorbed.

Investigations at Columbia University have shown that the inhibiting factor is the dominant isotope U238, representing 99.3 per cent. of the element. This absorbs the first three neutrons discharged by another isotope, U235, which forms 0.7 per cent. of the total less a trace attributable to the unimportant U234.

The problem of separating sufficient quantities of U235 from U238 to enable the chain reaction to be maintained, it is considered, is unlikely to be solved by present laboratory methods, but the results of doing so would justify a large expenditure in research. The energy produced as indicated in the laboratory tests was at the rate of 180 million electron volts per fissure when the ion chamber was exposed to slow-moving neutrons, as against 5 million from natural "kicks" of alpha particles. The conceptrated nature of the power that would become available is shown by comparison with the energy liberated in the combustion of an atom of coal, which is from 6 to 8 electron volts.

The largest source of uranium is the Belgian Congo, with an annual output of 1,000 tons of ore. Canada produces about 24,000 lb. of uranium salts annually, and Czecho-Slovakia, formerly, from 12,000 to 20,000 lb. In carnotite ores of the United States, not at present separated, there are estimated to be between 18,000 and 29,000 lb. of uranium salts. As the price of uranium is only about 8s. per lb., the cost of providing enough material for practical tests would be insignificant.

# NEW ELECTRICAL PRODUCTS

## A Review of Equipment Recently Marketed

### Transportable X-ray Outfit

SATISFACTORY mechanical adjustment and transportability, two features which are often regarded as irreconcilable, are well combined in the Type MX-1 X-ray apparatus made at Wembley by WATSON & SONS (ELECTRO-MEDICAL), LTD., 76, Castle Street, Reading, Berks.

A demountable stand permits the apparatus to be dismantled for packing in four carrying cases, which are easily accommodated in a small motor car. The high-voltage and filament transformers are enclosed together with the X-ray tube in an earthed metal container that is vacuum-filled with oil, which both insulates and cools the "head."

Transportable X-ray apparatus ready for use, dismantled, and packed

The tube itself is of Machlett manufacture (U.S.A.), with the anode extension treated by a process that is claimed to minimise the adverse affect of the heat evolved on the insulating properties of the oil. The resulting increased thermal capacity enables screening to be carried on for a longer continuous period than would otherwise be advisable. A lead sleeve around the discharge chamber limits the beam of radiation; the anode is of copper with a tungsten target and 20 deg. line focus, the effective focal spot being only 1.1 mm. square.

For its size the 10 mA at 60 kV rating is generous. In the control box are non-interchangeable sockets into which all leads are plugged from the front. It incorporates an auto-transformer for operation from any 50-cycle AC mains between 95 and 240 V, taking 5A input at 230 V, without appreciable affect from mains variations up to plus or minus 10 V.

A selector switch provides three values of milliamperage and exposures are made by a hand press-button switch connected by a flexible lead so that the operator may stand clear of the primary beam. The timing dial is calibrated in quarter-seconds up to 12 seconds; the pointer of the time switch can be turned backwards if inadvertently set for too long an exposure.

The base is a light alloy casting on twin self-aligning castors of moulded bakelite, which render the equipment very mobile even on thick pile carpet. So easily can it be moved that it has not been necessary to provide for lateral movement on the horizontal cross-arm which supports the shockproof tube head on a trunnion, rotatable in two planes, with vertical adjustment by self-sustained rack mechanism actuated by a winding handle. The stand can be dismantled by one person in about two minutes, there being no screws or loose parts.

An alternative stationary stand model is also available.

### Conduit Fitting

Fresh additions to the range of conduit fittings obtainable from the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, London, W.C.2, include a shallow pressed-steel switch box, only one inch deep, for use with 5-A switches and socket outlets; it has knock-out holes and four sizes are available in one- or two-gang form, with or without a short screwed spout.

Galvanised flanged couplers, each fitted with a leather washer, a thin sheet-iron washer and a brass male bush, are now also available in five sizes. Malleable iron conduit unions, heavily galvanised, in the same sizes, have been added, and a series of adaptable junction boxes in nine sizes of a heavy watertight pattern have a machined lid fitted with special brass hexagon-headed screws and outside fixing lugs, either galvanised or in black enamel finish.

Six patterns of galvanised "hospital" type distance saddles are made with a standard ½-in. clearance, corresponding to spouts on bracket boxes, etc., with one to six ways.

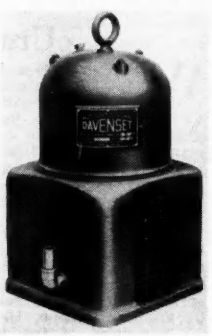
### Brazing Alloy

Since the introduction of the low-temperature "Sil-fos" brazing alloy another with similar characteristics, but available at a lower price, has been named "Silbralloy" by JOHNSON, MATTHEY & CO., LTD., 73, Hatton Garden, E.C.1.

It has a lower content of silver and is intended for use on copper and copper-rich alloys on which it makes strong joints, resistant to corrosion. It melts at 694 deg. C. and flows readily when the parts to be joined reach cherry-red heat, so that there is no danger of "burning" the metals, while the alloy is self-fluxing on copper. Its ductility is such that it can be rolled and supplied in the form of strip, or as rings, foil inserts, or in other special forms when furnace brazing is intended, as for mass production work.

### Automatic Pump

An automatic pump of unconventional appearance is the latest product of PARTRIDGE, WILSON & CO., Evington Valley Road, Leicester. This "Davenset" will conveniently drain A.R.P. shelters or flood water from cellars, &c., as the sump need not be greater than 18 in. sq. by 12 in. deep.




Automatic watertight motor pump

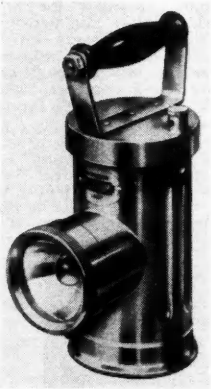
It is quite self-contained, transportable and may be operated completely submerged; 4.5 in. rise or fall in water level suffices to move float mechanism, which is completely enclosed, through a "frictionless" gland connection to a quick make and break "Crabtree" switch mounted on the motor, which is enclosed in a watertight compartment above the pump. The 250-W induction motor is of B.T.H. make, normally single-phase for 200 to 250V. but non-standard machines will be quoted for on request.

Grease-packed ball bearings are fitted, the spindle being flexibly coupled vertically through a spring-loaded packing gland to the centrifugal impeller below, which is of 3 in. diameter and runs at 2,850 RPM.

The pump does not require priming, and will lift 1,000 gal. per hour under a 5 ft. head, the maximum head for which it is designed being 24ft. The intake is protected by dual grills and a gauze strainer, while the outlet is intended to be conected to a 1-in. rubber hose or a ¾ in. gas pipe.

### Wardens' Handlamp

For the use of air-raid wardens in emergencies, BRITANNIA BATTERIES, LTD., of Redditch, Worcs., have modified their "Alklum" inspection lamp to comply with the regulations of the Air Raid Precautions Department of the Home Office, and at the same time provide a lamp which will satisfy the Ministry of Mines for use with safety in gas-laden or explosive atmospheres.



ARP battery lamp

This lamp uses a 2.5-V, 10-Ah alkaline battery which gives 20 hours light on one charge. Little need be said regarding the merits of this type of battery where hard usage and reliability are of the utmost importance. It is capable of maintaining its charge during long periods of idleness. The container is made from solid drawn steel, finished usually in black, with chrome bezel ring. The reflector is adjustable for focusing purposes by revolving the bezel ring. Switching is achieved by simple rotation of the carrying handle, thereby eliminating danger of sparking at the switch contacts. The whole design is simple yet most robust.

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## City and Guilds Report

THE annual report of the Council of the City and Guilds of London Institute is very much curtailed this year. It records that examinations were held in 1939 at 556 centres in Great Britain and Ireland and at 121 centres overseas. Of the 40,471 candidates, 38,189 (an increase of 14.5 per cent.) entered for technological subjects. Those examined overseas totalled 4,016, the net increase of 287 candidates being mainly in the subjects of telecommunications (1,072 candidates, 163 increase) and electrical engineering practice (1,532 candidates, 10 increase). Centres in India and Malaya furnished more than two-thirds of the candidates overseas. At home telecommunications candidates increased by 2,442 to 16,569; among newer subjects there were 36 candidates for illuminating engineering, 393 for welding, 132 for radio service work and 132 for boiler-house practice. Syllabuses for 140 subjects will remain unchanged for the 1940-41 session, except in electrical installation work, for which revised syllabuses have been prepared.

# COMMERCIAL and INDUSTRIAL NEWS

## June Overseas Trade. Cable-makers' Wages. Fuel Control Order

### Overseas Trade in June

IN June both imports and exports of electrical goods and apparatus were well below the previous month's values, imports particularly being at a very low level—£185,692, compared with an average of over £400,000 in the previous five months of the year. Exports contracted from May's record total of £1,477,336 to £1,043,846, but compared with June last year there was only a fall of £32,530 (3 per cent.), while imports were reduced by £75,106 (28 per cent.).

For the half-year to the end of June the total value of exports of electrical goods and apparatus was £7,464,287, an increase of £1,140,014 (18 per cent.) over the corresponding period of 1939. Imports aggregated £2,247,293, an increase of £811,491 (56 per cent.).

### Women in Industry

A quarter of a million more women could be absorbed into industry almost immediately but for the lack of the right number of skilled men and women to fill key posts. This statement was made by Mr. Ernest Bevin, the Minister of Labour, at a lunch arranged last week by the British Federation of Business and Professional Women for the purpose of asking him to let women help to win the war.

The shortage of skilled workers, he said, was due to the fact that it was impossible to produce them in a few weeks, since much of their skill was due to heredity, training and ambition. The country was now suffering from its neglect of thousands of skilled men and women through unemployment during the past fifteen years, and no Minister of Labour could make up the loss the nation had sustained except by devious ways and dilution. They were, however, going to use the services of both men and women to the greatest possible extent, and women must be enrolled in industry in increasing numbers.

Speaking of the increasing opportunities for welfare workers, Mr. Bevin mentioned that a scheme was under consideration for providing scholarships for training persons of all classes on equal terms. It was part of the Government's policy, too, that a person engaged for war work should be paid at a rate appropriate to the job, irrespective of sex or position. Following investigation into the effects of the long hours worked recently in factories, it had been decided to put back the provisions of the Factory Act into full operation on August 1st.

Miss Caroline Haslett, chairman of the Federation, presided, and Miss Irene Ward, M.P., and Lady Astor also spoke.

### American Orders and Exports

Orders received during April by United States electrical manufacturers, although below the March level, were well above that of April, 1939. The same was true of electrical exports which, at $11,811,777, were 25 per cent. above those for April of last year, bringing the total for the first four months of the year to $46,133,458, an increase of 34.2 per cent. Exports of AC generators increased from $182,637 in March to $413,965, but shipments of DC machines fell from $56,571 to $29,433. Exports of welding sets were higher. There was an advance from $30,590 to $117,777 in stationary motors over 200 HP, but exports of smaller sizes (1 to 200 HP) declined from $313,657 to $153,919.

### Wages in the Cable-making Industry

The Joint Industrial Council for the Electrical Cable-making Industry announces that the cost-of-living figure on July 1st was 87 per cent. above the 1914 level. This will involve an increase in wages on the third pay day in August in respect of the period for which payment is made on that pay day. The new scale is as follows: Male time-workers (21 years of age and over): Varying from 64s. 7½d. to 72s. 5½d. in District No. 1, and from 58s. 6d. to 66s. 6d. in District No. 2. Youths and boys under 21 years of age (time-workers): From 17s. 1½d. to 53s. 4½d. in District No. 1, and from 16s. 6d. to 50s. in District No. 2. Females, Districts 1 and 2: From 16s. 6d. to 21s. for girls of from 14 to 17 years of age, and from 33s. 6d. to 37s. 6d. for women of 18 and over. The scales for females do not include any service bonus that may be due.

### Aluminium Control

The Minister of Supply announced in the House of Commons last week that arrangements were being made for the responsibility for the control of the supply and distribution of aluminium to be transferred from his Ministry to the Ministry of Aircraft Production. The transfer is expected to take place shortly.

### Fuel Control Order

The Board of Trade has made the Control of Coal and Regulation of Consumption of Gas and Electricity Order (Stationery Office, 1d.).

This provides that no person shall (a) keep, store, move, transport, distribute, dispose of, acquire, use or consume any coal, or (b) use or consume in any regulated premises any gas or electricity in contravention of any direction given by the Secretary for Mines. The expression "regulated premises" means (a) any premises not used or appropriated wholly or mainly for industrial purposes, and (b) any premises used or appropriated wholly or mainly for industrial purposes, other than premises in which the quantity of coal supplied in the period of twelve months ended on June 30th, 1939, and the quantities of coal equivalent to the quantities of gas and electricity so supplied were together more than 100 tons. For the purposes of the Order the quantities of gas and electricity equivalent to 1 ton of coal shall be taken to be 100 therms and 1,400 kWh respectively.

It is explained that the purpose of the Order is to enable provision to be made for meeting difficult situations as the war proceeds, due to curtailment of supply resulting from enemy action or other causes, or the adaptation of coal distribution arrangements to give the maximum economy in transport and man-power.

### Industrial Welfare

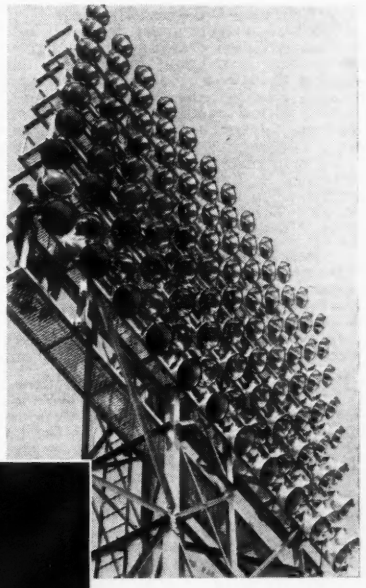
Following a recent broadcast talk by Mr. Ernest Bevin, Minister of Labour, in which he drew attention to the importance of the industrial welfare worker or personnel, the Industrial Welfare Society has received a great many demands for details of the work on which it has been engaged since the last war, as a result of which it has published a booklet entitled "Elements of Industrial Welfare and Personnel Management," which has been specially prepared for the guidance of those who, for the first time, are becoming interested in the industrial welfare movement. The booklet sets out the essential duties of a welfare and personnel supervisor in wartime. It can be obtained from the Society, 14, Hobart Place, S.W.1, at 4d. post free.

### Anglo-Spanish Publication

The Anglo-Hispano Trading Co., Ltd., 131, Baker Street, London, W.1, to whose activities we referred in a recent issue, has published the first number of the "Anglo-Hispano Magazine." This contains articles in English with parallel Spanish translations on a wide range of commodities suitable for export to Spain and South America. The subjects include pumps, carpets, furniture, &c., and there is also an article upon the central heating of towns by waste heat from power stations and gasworks.

### Electric Vehicle Figures

Replying to a question by Sir Arnold Gridley in the House of Commons last week Sir John Reith, Minister of Transport, said that there had been an increase of 578 in the number of licensed electric battery goods vehicles between August 31st, 1939, and May 31st last.



**Floodlights with an aggregate load of 1,152 kW are used to illuminate a playing field at Chicago. The installation, at Comiskey Park, was carried out by the Westinghouse Electric and Manufacturing Co. and consists of 768 1½-kW floodlights supported in batteries on eight steel towers**

### Lamp Manufacture in New Zealand

A modern factory for the production of electric lamps is now under construction at Miramar, Wellington, for the New Zealand Electric Lamp Manufacturers, Ltd. According to the *Electrical Engineer and Merchandiser*, it is expected that production will commence before the end of the year. The lamps will be manufactured to the standards of E.L.M.A., England, and also the relevant British Standard Specification, and will be distributed by the existing organisation.

### Railway Signal Glasses

The revision of B.S. 623 for colours for signal glasses for railway purposes has

brought about a slight regrouping of the glasses and a modification of some of the limits, including a diagram showing the area within which the proposed limits fall. Copies of this specification can be obtained from the British Standards Institution, 28, Victoria Street, London, S.W.1, price 2s. 3d., post free.

### Payments for Exports

The Treasury has issued a series of Orders under the Defence (Finance) Regulations stipulating the manner in which payment is to be made for exports from this country to Argentina, Belgian Congo, Brazil, Canada and Newfoundland, Netherlands East and West Indies, Roumania, Sweden, Switzerland and the United States. The arrangements vary in each case and it is therefore desirable that exporters should consult their bankers when proposing to ship goods to these countries.

### A Red Cross Appeal

The Red Cross "Penny-a-Week" Fund, which was launched at the Mansion House early in the war, is making rapid progress, and to-day it is supported by more than 23,000 employers and by the weekly pennies of more than 2,000,000 workers. While, however, these collections are increasing daily in volume, much more is urgently needed, and the British Red Cross asks employers and executives everywhere to help. The way the fund works is simple: the employee authorises the deduction of 1d. from his wages each week, and at regular intervals the employer places to the credit of the fund the total amount thus collected.

### Collecting Old Linen Drawings

The Women's Volunteer Service is collecting old linen drawings and tracings, which are treated and utilised for the making of articles where the use of fine linen is required, such as surgeons' caps, masks, pillow cases, aprons, &c. The Building Centre has undertaken to organise a campaign to keep the W.V.S. supplied with material, and appeals for old drawings in linen. Bundles should be addressed to the Centre, 158, New Bond Street, London, W.1, marked "Old linen," with the name of the sender.

### New Zealand Orders for Britain

During June the New Zealand Government spent £104,000 in Government contracts in Great Britain. The purchases were chiefly electrical requirements and railway material. Most of the orders were placed in Lancashire and London.

### Peruvian Customs Tariffs Modifications

A Decree issued on May 29th provides for increases in the Peruvian Customs duties on certain imports. The list includes the following electrical goods: Telegraphic apparatus for transmitting or receiving, including wireless telegraph and telephones and adaptors, the duty on which is raised from 1.0 sole per kg. gross to 1.80 soles; apparatus for electric heating, stoves weighing more than 10 kg., including those for use in industries, from 0.25 sole per kg. to 0.30 sole; electric refrigerators and accessories, from 0.25 sole per kg. to 0.38 sole; enamelled electric refrigerators and accessories, from 0.29 sole per kg. to 0.44 sole.

### Swiss Machine-building Industry

With an annual export figure of over 300 Swiss fr. per head of population, Switzerland occupies a leading position among exporting countries in relation to its size. The machine-building industry, states *Reuters Trade Service*, employs 5.6 per cent. of the entire working population, and is responsible for 25 per cent. of the country's industrial production. Various reasons, among others the lack of raw materials and the smallness of the home market, obliged Swiss machine builders to specialise in high-quality production in order to be able to sell outside the country. Thus machine building became chiefly an export industry, at least two-thirds of its production, absorbing to-day 300,000 HP or over 30 per cent. of the whole of Switzerland's motive power. As to the financial importance of this industry, 590 million Swiss fr. are invested in it, and the annual production of the machine industry represented a value of 650 million Swiss fr. in 1937. In 1939 exports of machinery, motor vehicles, instruments and apparatus were valued at 294 million fr. and represented 22.7 per cent. of the total exports of the country. Among the chief exports of the industry in 1939 were electrical machinery, etc., valued at 53,500,000 fr., machine tools 50,300,000 fr., textile machinery 29,400,000 fr. and internal combustion engines 25,900,000 fr.

### Strike in Eire E.S.B.

Our Dublin correspondent reports that employees in the Installation Department of the Eire Electricity Supply Board went in strike recently as a protest against the alleged "victimisation" of two members of their union. The men were dismissed on grounds of shortage of work, but the secretary of the Union claimed that there was no such shortage. Negotiations between the Board and the Union failed to secure the men's reinstatement.

### Insulated Conductors Export Group

It is proposed to extend the scope of the Insulated Conductors Export Group so as to include the following materials: Joint boxes, link disconnecting boxes; terminal and dividing boxes; feeder pillars; cabling inspection frames and covers. Manufacturers and exporters of these materials are invited to communicate with the Secretary of the Group, Mr. K. J. McKillop, High Holborn House, 49-51, Bedford Row, London, W.C.1 (telephone: Holborn 2701).

### Registered Electrical Contractors

At the last meeting of the Executive Committee of the National Register of Electrical Installation Contractors the following applications for registration were accepted: J. Alan Aspin, Ltd., Colne; F. H. Hellyar, Ltd., Barnes, S.W.13; Harold W. Williams, Newton Heath, Manchester; Lloyds Packing Warehouses, Ltd., Manchester.

At the same meeting one application was withdrawn, and one declined.

### Wireless Operators for the R.A.F.

The Royal Air Force needs recruits for training as wireless operators. The pay will be 2s. a day on enlistment, increasing to 3s. 6d. a day when qualified. In addition, all trainees will be given an opportunity to volunteer for additional training as air-gunners and qualifying for an air crew. In this case, upon qualification as a wireless operator-air gunner, the pay will be 7s. 9d. a day, with the rank of sergeant. The qualifications for enlistment as wireless operators under training are: Age between 18 and 38; medical category 1, 2a, 2, or 3; and a good standard of education.

### Retailers and National Savings

The National Savings Committee draws attention to the scheme which came into operation during the National Savings Week in June under which retailers may become honorary official agents for the National Savings Movement by encouraging their customers to purchase savings certificates. Honorary official agents will not stock certificates, but will be supplied with requisition forms, which will be completed by intending purchasers of certificates. Each day retailers will pass the completed forms, together with the total monies received, to a main Post Office chosen by customers. The Postmaster will issue the certificates and post them direct to the intended holders. Traders and firms willing to become agents should complete applications for appointment and send them to the local Savings Committee (whose address can be obtained from the local Post Office), or to the National Savings Committee, London.

### Prices of Materials

Henry Gardner & Co., Ltd., report, July 24th: No change in the prices of copper bars (best selected), sheet and rod, English pig lead, mercury and spelter. English block tin, £267, £2 increase.

Edward Till & Co., report July 24th: No change in the price of india rubber, Para fine.

### Dissolution of Partnership

Messrs. W. Bannister & J. Fitton, trading as Bannister & Fitton, manufacturers, factors, and retailers of radio and electrical apparatus at 27B, Milnrow Road, Rochdale, have dissolved partnership. Mr. Fitton will attend to debts and carry on the business.

### A Topical Poster

Steels & Busks, Ltd., Leicester, which owns S. & D. Rivet Co., has distributed widespread a striking poster headed "It all depends on me," in which it states: "If we each and all of us think this, and each and all of us do our utmost, our very utmost, on whatever work we are on, and do it with determination and cheerfulness, then we shall win this war."

### Catalogues and Lists

**Newton & Wright, Ltd.**, 68, Ballards Lane, Finchley, London, N.3.—An illustrated brochure describing X-ray equipment particularly suitable for hospitals of medium size. Also a current price list of "Omnipruf" X-ray tubes.

**Foster Transformers & Switchgear, Ltd.**, Wimbledon, London, S.W.19.—A leaflet giving particulars of low-voltage lighting and air-cooled transformers.

**Lincoln Electric Co., Ltd.**, Welwyn Garden City, Herts.—A pamphlet drawing attention to "Fleetweld" electrodes.

**The Benjamin Electric, Ltd.**, Brantwood Works, Tariff Road, Tottenham, London, N.17.—Leaflet No. 1659, entitled "Stop the Accidents," showing how good lighting prevents accidents, with special reference to the company's reflectors.

**Oldham & Son, Ltd.**, Denton, Manchester.—Illustrated folder descriptive of a battery lamp, resembling a miner's safety lamp, for lighting A.R.P. shelters.

**Graham Farish, Ltd.**, Bromley, Kent.—Illustrated and priced leaflet describing the "Miner" emergency lantern made of sheet-steel to take an ordinary tallow flame night-light.

**Silux, Ltd.**, 47-48, Berners Street, W.1.—Particulars, illustrations and prices of the Silux lighting fittings, British made units designed on the same lines as the Zeiss Ikon fittings, supplies of which are, of course, no longer available owing to the war.

**Marley Light Co., Ltd.**, 119, New Cavendish Street, W.1.—An illustrated catalogue of "Marley" corrected lighting units.

## Trade Mark Applications

AMONG recent applications for British trade marks are the following, objections against any of which may be entered within one month from July 17th:—

Reliance. No. 611260. Class 9 (IV). Telephones.—Reliance Telephone Co., Ltd., 39-41, Parker Street, W.C.2.

Stesco. No. 611552. Class 9 (IV). Dry batteries. — Mitsui Bussan Kabishiki Kaisha, Tokyo, Japan, trading also as Mitsui & Co., Ltd., at Royal Mail House, Leadenhall Street, E.C.3.

Minalpha. No. 611712. Class 9 (IV). Electric wire.—Johnson Matthey and Co., 78, Hatton Garden, E.C.1.

Biobar. No. 612079. Class 9 (IV). Alternating current rectifiers, coils for electro-magnetic machines, electric fire alarms, circuit-breakers, circuit closers, electric connections, contacts, control apparatus, current limiters, cut-outs, electric saucepans, coffee percolators, kettles, resistances, flat irons, soldering irons, switches, leakage indicators, terminals, thermostats, thermo-electric elements, relays, transformers, and electro-magnets, &c.—Bio Electric Co., Ltd., 18, Gibson Street, Glasgow, W.2.

Fluro. No. 612037. Class 9 (IV). Lighting fittings.—Benjamin Electric, Ltd., Brantwood Works, Tariff Road, Tottenham, N.17.

Polyvic. No. 611570. Class 17 (IV). Insulating material.—I.C.I. (Plastics), Ltd., Wexham Road, Slough, Bucks.

## INFORMATION DEPARTMENT

GENERAL inquiries from readers relating to sources of electrical goods, makers' addresses, &c., are replied to by our Information Department through the post. Inquiries should be accompanied by a stamped addressed envelope.

Our extensive records enable us to reply to most queries, but occasionally we ask for our readers' assistance in tracing names and addresses not known to us. We should be glad to have such information regarding the following:—

MAXIVEE miniature tumbler switches.
SOLACITE sheet insulating material.
W.H. (monogram in circle) starters.

# ELECTRICITY SUPPLY

## Bradford Alderman's Resignation. Commissioners Refuse Darlington Application

**Accrington.**—ELECTRICITY PROFIT.—The annual accounts reveal a balance of net revenue on the electricity undertaking of £19,813 against £17,476 for the previous year. With £15,619 from last year and a profit on the showroom of £294 there is a balance to carry forward of £35,726.

**Ashton-under-Lyme.** — MAINTENANCE OF APPARATUS.—In view of the difficulty experienced in obtaining spares for the maintenance of domestic apparatus and meters the electrical engineer has been authorised to purchase stocks of such materials up to the maximum value of £2,000.

**Barnoldswick.**—RESULT OF YEAR'S WORKING.—The Council's abstract of accounts shows a deficit on the Electricity Department of £683.

**Bedford.**—SUPPLY PROJECTS.—The Electricity Committee is to provide three-phase supplies to St. Peter's Hospital and the post office exchange and offices at a cost of £2,455, and to the factory of the Co-operative Wholesale Society, Ltd. (£863).

**Bradford.** — ALDERMAN RESIGNS. — As briefly reported in our last issue, Alderman J. W. Longley, who has been chairman or deputy chairman of the Electricity Committee for nearly 22 years, tendered his resignation as a member of the Council at its meeting last week.

Discussion took place on a recommendation of the Committee asking the Council to approve a minute expressing its appreciation of the ability, care and vision with which the retiring city electrical engineer had carried out his duties during his 36 years with the Council. Mention was made of the report of the special committee of inquiry into certain matters concerned with the Department. Councillor R. A. Mortimer asked if the recommendations had been carried out, particularly whether Mr. C. E. Allsop (commercial assistant) had been before the Electricity Committee and had been reprimanded; and also whether he was still holding his position. Alderman Longley replied "No" to the first question and "Yes" to the second, and "No" to a further question whether Mr. Smith (a clerk) had been commended.

Councillor J. Harrison then moved the reference back of the minute referring to the services of the city electrical engineer and said that "in plain dyers' language the attitude of the Committee to the report really meant that the Council could go to blazes." The amendment was carried by 36 votes to 21.

A motion by Councillor Mortimer to refer back a recommendation by the Electricity Committee that the chairman and deputy chairman should be empowered to deal with routine matters during the recess was defeated by 36 votes to 21.

Alderman Longley said he had come to the conclusion that as long as he was chairman the electricity undertaking would not get along as smoothly as it should do, and he thought too much of it to let his presence on the Committee stand in its way. He had twice previously offered his resignation, but it had been refused. After the vote of the Council, which he considered a vote of censure, he had no option but to adhere to his decision to resign.

**Brighton.** — HIGHER CHARGES. — Increases in charges to take effect from this week are recommended by the Electricity Committee. Within the county borough of Brighton, and at North Hove, Portslade and Southwick, it is proposed to raise the lighting flat rate from 4½d. to 6d. (prepayment meters, from 5d. to 6½d.). The rate for cinema projectors (where special two-part tariff is not adopted) will be advanced from 2½d. to 3d. Flat rates for power, heating and cooking will be increased from 1d. to 1¼d., and the "all in" rate for cooking through prepayment meter from 1⅛d. to 1⅜d. The two-part tariff fixed charge is unaltered, but there is to be an increase in the "unit" charge from $\frac{2}{10}$d. to $\frac{11}{10}$d. This applies also to Telscombe and Saltdean. Other alterations relate to electric vehicle battery charging, off-peak supplies, and industrial motive power (Telscombe and the part of Saltdean outside the county borough). Most rates in outside areas are to remain unchanged.

**Cardiff.**—IMPROVED FINANCIAL POSITION. —The accounts of the Electricity Department for the past year show a net profit of £31,560, compared with a deficiency of £7,504 in the previous year. Sales of electricity totalled 198.1 million kWh, representing a considerable increase over 1938-39.

**Chester.**—TARIFF INCREASE.—A loss of £1,303 for the past year is reported by the Electricity Committee, which recommends an increase of 20 per cent. in tariffs.

**Clitheroe.** — PURCHASE OF GISBURN UNDERTAKING.—The chairman and vice-chairman of the Electricity Committee have been deputed to consider an offer from Mr. J. H. Tattersall to purchase his electricity undertaking at Gisburn.

**Colwyn Bay.**—BULK SUPPLY TERMS.—The Lighting Committee has received formal notice from the North Wales Power Co. terminating the existing bulk supply agreement on December 31st next. The Company wishes all undertakings in the area to have the same terms of supply and has agreed to make an allowance of £816 in respect of 1939 if the Council will accept the terms calculated in accordance with Section 12 of the Electricity Supply Act, 1926, viz., 0.25d. per kWh; coal charge 0.009d. per 1d. over 15s. per ton plus 10 per cent., a fixed charge of £7,494 per annum and a maximum demand charge of £4 per kWh. The Council has accepted this offer.

**Darlington.** — COMMISSIONERS REFUSE CONSENT.—The Town Council has been notified that the Electricity Commissioners are not prepared to consent to the payment out of revenue of £1,164 and £900 for switchgear and extra-high-voltage cable. No further action is to be taken.

**Docking.** — OBJECTION TO CONTRACT CLAUSE.—At a recent meeting of the Rural District Council a letter was received from the East Anglian Electric Supply Co. requesting the insertion in the contract for an electricity supply of a clause by which "in the event of the pre-war cost to the Company of providing electricity showing an increase, or of the pre-war conditions being adversely affected by the present war, the consumer will also pay such sum as the Company shall from time to time consider to be properly related to the provision of the supply." The Council, however, was not willing to agree to this until the effects of the war became onerous and the Company made definite proposals regarding increases in charges.

**Grimsby.**—OUTPUT DECREASES.—It was reported to the Town Council at its last meeting that the output of the Electricity Department for the past year was 53.4 million kWh, a decrease of 3.1 million kWh. There was a balance in hand on the year's working, after meeting £5,457 on appropriation account, of £1,207.

**Isle of Man.**—MINIMUM CHARGE WITHDRAWN.—Douglas Corporation has decided to suspend the minimum charge for electricity for the duration of the war, following consideration of a report by Mr. Bertram Kelly, the electrical engineer and manager.

**London.** — WESTMINSTER. — The City Council Emergency Committee has approved an estimate of £1,505 for 430 illuminated location signs.

ST. MARYLEBONE.—The Electricity Committee reports a loss for the year of £39,223.

FINSBURY.—An electric kettle is to be provided at each of the air-raid wardens' posts.

**Middlesbrough.** — HIGHER CHARGES FORESHADOWED.—In the abstract of accounts of the Council's electricity undertaking the borough treasurer issues a warning that in order to preserve the undertaking's sound financial condition it may be necessary to revise tariffs. He states that although the balance in hand is higher this year than last, it must be remembered that no amount has been transferred to the rates whereas in 1938-9 the sum of £5,357 was used for this purpose. Capital expenditure during the year was £18,948 compared with £59,773 for the previous year, and the outstanding debt at £354,068 was £3,086 less than in the year before.

**North Wales.**—SCHEME POSTPONED.—At the quarterly meeting of the North Wales and South Cheshire J.E.A. the North Wales Power Co. reported that owing to the present situation the construction of the proposed transmission line along the Conway Valley to Colwyn Bay had been postponed.

**Preston.**—LOAN FOR APPARATUS.—Application is being made for sanction to borrow £22,500 for financing hire-purchase transactions and £7,000 for the purchase of consumers' apparatus.

**Reading.**—RESULTS AND PROSPECTS.—The annual report of the engineer and manager of the Electricity Department (Mr. J. W. Arthur) placed before the Council at its last meeting showed an increase in sales of 11.5 million kWh (29.2 per cent.). There was a net profit for the year of £588, after meeting special expenditure amounting to £4,633. As to the future, the engineer commented that they could not, under present conditions, expect to increase the output to the same extent as last year, which was mainly the result of previous intensive canvassing, but they could expect to hold their own, with possibly some increase.

**Rotherham.**—INCREASED BALANCE.—The Electricity Committee reports a balance for the year of £37,232 as compared with £65,877 for the previous year.

**Shipley.** — ELECTRICITY PROFIT. — The U.D.C. Electricity Committee reports a net profit of £2,611 for the past year.

**Southport.**—VALUE OF SHOWROOMS.—Mr. W. T. Gann, electrical engineer, in his annual report, comments on the important part the showrooms continue to play in popularising the use of electricity. The new theatre and its model kitchen, he says, have been greatly admired, and the use of the cinematograph projector is of very great value. The Committee's policy in the matter of publicity, he adds, has already borne great fruit.

**Whitstable.**—PROTEST AGAINST PRICE INCREASE.—At the last meeting of the U.D.C. a decision of the Whitstable Electric Co. to add 10 per cent. to its charges was criticised. It was agreed to write the Electricity Commissioners pointing out that in view of the fact that for the year ended December last the Company, in addition to paying a dividend of 10 per cent., issued bonus shares, the Council was strongly of the opinion that the Commissioners should bring pressure to bear upon the Company to withdraw the additional charge.

**Worksop.**—LOSS ON YEAR'S WORKING. —Mr. G. R. Laithwaite, who was appointed borough electrical engineer last summer, reports a net loss of £4,439 on the working of the undertaking for the past year, although there was an increase in gross profits of £2,821.

**York.**—PURCHASE OF METERS.—Surplus revenue amounting to £4,987 is to be utilised for the purchase of new meters, &c.

# TRANSPORT

**Aberdeen.**—STREAMLINED TRAMS.—Last week the first of four new streamlined trams was given a trial run, the passengers being members and officials of the Council and contractors' representatives. Mr. L. Dobson (English Electric Co.) said his company had provided Aberdeen with what was, so far as he knew, the finest tram in the world.

Outstanding features of the new car, apart from its streamlined bodywork, are two central entrances and twin stairways to the top deck. Seating for 76 people is provided with upholstery which gives the maximum comfort. Loudspeaker equipment is fitted for announcing the stops.

Presiding at tea, Councillor Collins, convener of the Transport Committee, said it was his ambition to see the whole

(*Continued on next page.*)

# NEW PATENTS

## Electrical Specifications Recently Published

*Compiled by a firm of chartered patent agents. The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.*

**1938**

30190. "Wire broadcasting receivers." P. P. Eckersley and R. E. H. Penter. October 18th, 1938. (522889.)

32855. "Electric motor controllers." Igranic Electric Co., Ltd., and J. R. Taylor. November 11th, 1938. (522779.)

34822. "Electrical apparatus for aeroplanes for indicating height as well as distance of solid objects in the plane's path." E. G. Wild. November 30th, 1938. (522890.)

35730. "Permanent magnets, and processes of treating alloys for such magnets." L. W. Meyer (Naamlooze Vennootschap Philips' Gloeilampenfabrieken. December 7th, 1938. (522731.)

36012. "Protective devices for periodically actuated electric contact arrangements." Patentverwertungs Ges. Hermes. December 9th, 1937. (522783.)

36228. "Ultra-sensitive balanced electro-magnetic relay." Soc. Anon. Pignone-Officine Meccaniche e Fonderia. December 20th, 1937. (522680.)

36283. "Furnace fronts suitable for alternative methods of firing." J. Howden & Co., Ltd., and W. Nelson. December 13th, 1938. (522692.)

36297. "High-pressure mercury-vapour electric-discharge devices." General Electric Co., Ltd. (Patent Treuhand Ges. für Elektrische Glühlampen). December 13th, 1938. (Addition to 503112.) (522697.)

36315. "Electric motor control systems." British Thomson-Houston Co., Ltd. December 14th, 1937. (522700.)

36317. "Control systems for electrically operated winding engines and like." British Thomson-Houston Co., Ltd., H. W. C. Liddiard and T. H. Petch, jun. December 13th, 1938. (522701.)

36358. "Amplitude-limiting circuit arrangements." Marconi's Wireless Telegraph Co., Ltd., and D. J. Fewings. December 13th, 1938. (522709.)

36361. "Thermionic valve frequency-changers." Marconi's Wireless Telegraph Co., Ltd., and D. A. Bell. December 13th, 1937. (522710.)

36383. "Fuse carriers for electric fuses of the cartridge type." J. H. Tucker & Co., Ltd., and F. C. Fuke. December 14th, 1938. (Cognate applications 6270/39 and 14677/39.) (522711.)

36416. "Electric motors." Matthews & Yates, Ltd., and A. Bray. December 14th, 1938. (522715.)

36447. "Self-locking electric switches." Oak Manufacturing Co. December 20th, 1937. (522735.)

36462. "Synchronisation of television receiving apparatus." Murphy Radio, Ltd., and K. S. Davies. December 14th, 1938. (522737.)

36463. "Systems of electrical distribution." British Thomson-Houston Co., Ltd. December 14th, 1937. (522738.)

36502. "Construction in or relating to fuse elements for electric cartridge fuse-links." Lawson Beck, Ltd., and A. J. A. Beck. December 15th, 1938. (522746.)

36505. "Electrical coupling devices." E. Showell & Sons, Ltd., and A. J. Pearce. December 15th, 1938. (522747.)

36524. "Manufacture of imbricated electro-magnetic elements." G. W. Rawlings. December 15th, 1938. (Addition to 504800.) (522749.)

36543. "Method of producing selenium rectifiers and selenium photo-cells." C. Kreutzer. December 17th, 1937. (Cognate application 36544/38.) (522755.)

36570. "Telephone systems." L. E. Ryall. December 15th, 1938. (522758.)

36578. "Valve mechanism." British Thomson-Houston Co., Ltd. (General Electric Co.). December 15th, 1938. (522759.)

36610. "Electrical connectors." W. A. Snowden and W. J. Bell. December 15th, 1938. (522766.)

36663. "Electrical circuit-breakers, cut-out switches and the like." H. J. Osborn & Sharp, Ltd., and W. C. Barry. December 16th, 1938. (522787.)

36705. "Electro-magnetically operated electric switches." Standard Telephones & Cables, Ltd. March 29th, 1938. (522798.)

36709. "Electric signal transmission systems." Standard Telephones & Cables, Ltd. February 18th, 1938. (522799.)

36728. "Machine for casting metal parts, especially the girds of accumulator plates in lead and the like." Etablissements D. Doyen Soc. Anon. December 17th, 1937. (522801.)

36739. "Electron-discharge device oscillation generators." Fides Ges. für die Verwaltung und Verwertung von Gewerblichen Schutzrechten. December 17th, 1937. (522803.)

36777. "Impulse senders for telephone systems." General Electric Co., Ltd., and C. C. Puckette. December 17th, 1938. (522807.)

36778. "Thermionic time-delay circuits." General Electric Co., Ltd., and J. Scowcroft. December 17th, 1938. (522803.)

36858. "Electric fires." Alneco, Ltd., and W. Neale. December 19th, 1938. (522821.)

36918. "Electric hand igniters for gas burners." P. A. Ficht. December 18th, 1937. (522838.)

36937. "Voltage-regulating systems." British Thomson-Houston Co., Ltd. December 20th, 1937. (522841.)

37036. "System for heating a cathode of vacuum tube." Standard Telephones & Cables, Ltd. (Nippon Electric Co., Ltd.). December 20th, 1938. (522902.)

37042. "Apparatus for the transmission of television and the like." General Electric Co., Ltd., and D. C. Espley. December 20th, 1938. (522903.)

37043. "Circuit arrangements for operating gas-filled electric-discharge devices." General Electric Co., Ltd. (Patent-Treuhand Ges. für Elektrische Glühlampen.) December 20th, 1938. (522904.)

37050. "Magnetron tubes suitable for use on ultra-short waves." Telefunken Ges. für Drahtlose Telegraphie. December 20th, 1937. (522905.)

37129. "Metal-vapour electric-discharge lamps." Siemens Electric Lamps & Supplies, Ltd., W. Le Marechal and J. N. Aldington. December 21st, 1938. (522917.)

37136. "Photographic photo-electric liquids." K. Vickenhuber and A. Handler. December 22nd, 1937. (522919.)

37137. "Photographic photo-electric exposure meter." K. Vickenhuber and A. Handler. December 22nd, 1937. (522920.)

37192. "Magneto-strictive echo-sounding apparatus." Marconi's Wireless Telegraph Co., Ltd., and N. P. Hinton. December 21st, 1938. (522929.)

**1939.**

80. "Control systems for electrical heating units." Proctor & Schwarz, Inc. January 21st, 1938. (522930.)

987. "Electric condensers." Fides Ges. für die Verwaltung und Verwertung von Gewerblichen Schutzrechten. January 11th, 1938. (523858.)

993. "Translating devices for translating radiation energy variations into electrical energy variations." A. Carpmael (Telefunken Ges. für Drahtlose Telegraphie). January 11th, 1939. (522860.)

1903. "High vacuum vapour-jet pumps." Allmanna Svenska Elektriska Aktiebolaget. January 22nd, 1938. (522932.)

1905. "Extinguishing chambers with differential pistons for electric circuit-breakers." Allmanna Svenska Elektriska Aktiebolaget. January 22nd, 1938. (522934.)

6410. "Resilient motor suspensions." Westinghouse Electric International Co. February 26th, 1938. (522830.)

8273. "Methods of manufacturing secondary emitting electrodes." Baird Television, Ltd., and A. Sommer. March 15th, 1939. (522774.)

8547. "Pneumatic operation of electric switches." British Thomson-Houston Co., Ltd. March 19th, 1938. (522882.)

20048. "Magnetic separators." W. H. Browning (trading as Brownings Electric Co.). July 10th, 1939. (522937.)

23281. "Selective switches such as are used in automatic telephone systems." Standard Telephones & Cables, Ltd. (G. Deakin and Bell Telephone Manufacturing Co. Soc. Anon.) September 6th, 1938. (Divided out of 522198.) (Cognate application 23271/39.) (522726.)

## Transport (*Concluded*)

of the tramway fleet modernised. There was a tendency on the part of some people to believe that trams had outlived their usefulness, but he had never subscribed to that view.

A suggestion that by improving its tram services Aberdeen might be able to dispense with buses in the main thoroughfares and use them as "feeders" for the tram services was made by Mr. Henry Riches, traffic commissioner for North of Scotland area.

**Bradford.**—Cost of Replacing Overhead Equipment.—At a recent meeting of the Transport Committee the manager reported on the bad condition of the overhead equipment on the Oakenshaw trolley-bus route and as to the cost of replacement. It was decided to recommend that a service of motor-buses should be substituted for the trolley-buses.

**Coventry.**—Trams Again.—It is reported in the *Passenger Transport Journal* that the reconstruction of the old tramway to Stoke is now complete, but further work on the Bell Green route is to be carried out before the Stoke service is resumed.

**Leeds.** — Tramway Extension. — The Transport Department has completed the tramway extension to the Belle Isle estate and doubling of the track in Balm Road.

**Reading.**—Good Results from Trolley-buses.—In large measure the excellent result of the past year's working of the transport undertaking—the net profit of £15,544 was more than twice as much as in the previous year—can be ascribed to the popularity of the trolley-buses which superseded the trams in May last year. In his annual report, Mr. J. M. Calder, the general manager, says that the outstanding comment of the Reading travelling public on the trolley-buses has been regarding the speedy, smooth and clean travel which they provide.

# RADIO

**Australia.**—Radio Link With Philippines.—A radio telephone service between the Philippines and Australia, was inaugurated recently, when the Australian Prime Minister, Mr. R. G. Menzies, and the U.S. High Commissioner for the Philippines, Mr. F. B. Sayre, exchanged greetings and invitations to visit their respective countries.—*Reuter.*

**Great Britain.**—Radio Relay Statistics.—At March 31st last there were 279,377 subscribers to 281 radio relay exchanges, compared with 270,596 subscribers to 284 exchanges at December 31st, 1939.

The Post Office Telecommunications Department has stated that the recent Aliens Order concerning the possession of wireless apparatus by enemy aliens and the recent Defence Regulations restricting the installation of wireless apparatus in road vehicles does not affect the provision of wireless relay service to enemy aliens or caravans.

**Japan.**—New Radio Links.—*Reuter* reports from Tokyo that direct radio-telephone circuits have been inaugurated between Osaka and Kabul, Afghanistan, and Tokyo and Lima, Peru.

**Switzerland.** — Direct Service to America.—A direct radio-telephone service between Switzerland and the United States has been commenced. The service is operated from the Swiss short-wave transmitter at Schwarzenburg, between 2 p.m. and 8 p.m. every day. It is expected that similar services will shortly be established between Switzerland and other overseas countries.—*Reuter.*

# FINANCIAL SECTION

**New Companies. Capital Returns. Debenture Charges. Bankruptcies and Liquidations. Reports and Dividends. Stocks and Shares.**

## New Companies Registered

**R. E. Thompson & Co. (Sunbury), Ltd.**—Private company. Registered July 20th. Capital, £3,000. Objects: To acquire the business of instrument makers now carried on by J. B. Andrews and R. E. Thompson, at Station Road, Sunbury-on-Thames, Middlesex, as R. E. Thompson & Co., and to carry on the business of scientific instrument makers, electrical and mechanical engineers and contractors, &c. Permanent directors: J. B. Andrews, 1, Lindsay Road, Hampton Hill, Middlesex, and R. E. Thompson, 112, Evelyn Crescent, Sunbury-on-Thames. Registered office: Station Road, Sunbury-on-Thames, Middlesex.

**G. T. Bellamy & Co., Ltd.**—Private company. Registered July 15th. Capital £500. Objects: To acquire the business of an electrical engineer carried on by L. Bellamy at 33, Cherry Orchard Road, Croydon, as G. T. Bellamy & Co. Directors: L. Bellamy, L. Gould, and G. K. Bellamy, all of 33, Cherry Orchard Road, Croydon, and two others. Secretary: L. Bellamy. Registered office: Cherry Orchard Road, Croydon.

**E. W. Arculus, Ltd.**—Private company. Registered July 17th. Capital, £1,000. Objects: To carry on the business of manufacturers of and dealers in ultra-violet, infra-red and radiant heat lamps, etc., and to acquire the business now carried on at 50, Portland Terrace, Southampton, as the Health Ray Co. Permanent directors: E. W. Arculus, and E. E. Arculus, both of 5, Christchurch Road, Winchester, Hants. Registered office: 50, Portland Terrace, Southampton.

**Thermal Manufactures, Ltd.**—Private company. Registered July 16th. Capital, £100. Objects: To manufacture and sell convectors, heater batteries, air heaters and coolers, and to carry on the business of manufacturers and vendors of air-conditioning and heating equipment of all kinds; iron, brass and other metal founders, etc. Directors: D. H. Skermer, 2, Aldersgate Road, Stockport, and A. Ogden, 51, Edge Lane, Chorlton-cum-Hardy, Manchester. Secretary: A. W. Alexander. Registered office: 3, York Street, Manchester, 2.

**D.K.B. Electric, Ltd.**—Private company. Registered July 19th. Capital, £100. Objects: To carry on the business of electrical engineers and contractors, &c. Directors: A. R. Kearney, 136, Kenley Road, Merton Park, S.W.19, and two others. Registered office: 109, Kingsway, W.C.2.

## Companies' Returns

### Statements of Capital

**Tamworth District Electric Supply Co.**—Capital £250,000 in 50,000 6 per cent. cumulative preference, 50,000 4 per cent. cumulative and participating preference, and 150,000 ordinary shares of £1. Return dated March 6th. 50,000 6 per cent. preference, 25,000 4 per cent. preference, and 125,000 ordinary shares taken up. £120,000 paid on 30,000 6 per cent. preference, 25,000 4 per cent. preference, and 65,000 ordinary shares. £80,000 considered as paid on 20,000 6 per cent. preference and 60,000 ordinary shares. Mortgages and charges: £88,686 3s. 11d.

**South Somerset & District Electricity Co., Ltd.**—Capital, £200,000, in £1 shares. Return dated March 20th. All shares taken up. £206,531 5s. paid (including 2s. 4½d. per share premium on 55,000 shares). Mortgages and charges nil.

**North Metropolitan Power Station Co., Ltd.**—Capital, £100 in £1 shares. Return dated March 26th. All shares taken up. £100 paid. Mortgages and charges: £5,106,496.

**Tudor Accumulator Co., Ltd.**—Capital, £100,000 in £10 shares. Return dated April 10th. All shares taken up. £29,000 paid (£10 on 2,600 and £2 10s. on 1,200 shares), £71,000 considered as paid (£10 on 6,200 and £7 10s. on 1,200 shares). Mortgages and charges nil.

**Wellingborough Electric Supply Co., Ltd.**—Capital, £50,000 in £10 shares. Return dated April 23rd. All shares taken up. £50,000 paid. Mortgages and charges: £45,000.

**Paignton Electric Light & Power Co., Ltd.**—Capital, £100,000 in £1 shares. Return dated April 23rd. All shares taken up. £60,000 paid, £40,000 considered as paid. Mortgages and charges nil.

**Seaton & District Electric Light Co., Ltd.**—Capital, £50,000 in £1 shares. Return dated May 1st. All shares taken up. £50,000 paid. Mortgages and charges nil.

**J. R. Halliwell, Ltd.**—Capital, £1,000 in £1 shares. Return dated December 31st, 1939 (filed March 9th, 1940). 875 shares taken up. £875 paid. Mortgages and charges nil.

**Power Securities Corporation, Ltd.**—Capital, £2,000,000 in 1,000,000 7 per cent. cumulative participating preference and 1,000,000 ordinary shares of £1. Return dated February 28th. 500,000 preference and 800,000 ordinary shares taken up. £1,300,000 paid. Mortgages and charges nil.

**Clifford & Snell, Ltd.**—Capital, £5,000 in 3,900 ordinary shares of £1, 4,000 deferred ordinary shares of £5, and 4,000 deferred "A" shares of 6d. each. Return dated April 9th. 3,338 ordinary, 4,000 deferred ordinary and 4,000 deferred "A" shares taken up. £4,188 paid on 3,338 ordinary, 3,000 deferred ordinary and 4,000 deferred "A" shares. £250 considered as paid on 1,000 deferred ordinary shares. Mortgages and charges, nil.

**Northern Electric Wire Co., Ltd.**—Capital, £100 in £1 shares. Return dated January 11th (filed February 6th). Three shares taken up. £3 paid. Mortgages and charges nil.

### Mortgages and Charges

**Kelvin Norton Electric Co., Ltd.**—Mortgage dated July 8th, 1940, to secure all moneys due or to become due from the company to Midland Bank, Ltd., on two sums of £490 and £110, respectively, due or to become due under a contract.

**Watliff Co., Ltd.**—Mortgage on Ashley Works, South Street, and The Retreat, 14, Ashley Road, both in Epsom, dated July 11th, 1940, to secure £5,000. Holder: C. Featherstone Coles, "Hillcrest," The Green, Ewell, Surrey.

**Keller Electrical Industries, Ltd.**—Particulars filed of debentures, not exceeding £1,800, authorised July 6th, 1940, charged on the company's property, present and future, including uncalled capital, the amount of the present issue being £1,800.

**Nelco, Ltd.**—Land Registry Charge on freehold land, hereditaments and premises at Station Road, Shalford, Surrey, dated June 27th, 1940, to secure all moneys due or to become due from the company to Midland Bank, Ltd.

**Carter & Co. (Nelson), Ltd.**—Conveyance dated July 1st, 1940, to secure one-half the expenses for a road-making scheme. Property charged: Land at Copse Road and a proposed street in Fleetwood. Holders: Fleetwood Estate, Ltd., The Estate Office, Fleetwood.

**Pioneer Telephone Manufacturing Co., Ltd.**—First mortgage debenture charged on the company's undertaking and property, present and future, including uncalled capital, dated July 4th, 1940, to secure all moneys due or to become due from the company to Martins Bank, Ltd.

### Increase of Capital

**Marconi-Ekco Instruments, Ltd.**—The nominal capital has been increased by the addition of £45,000 in £1 ordinary shares beyond the registered capital of £5,000.

### Receivers Appointed

**Austin Clarke, Ltd.**, electrical and general engineers, &c., 63, Newman Street, W.1.—J. Lewin, F.S.A.A., of 271-3, Oxford Street, W.1, was appointed receiver and manager on July 11th, 1940, under powers contained in instrument dated April 10th, 1940.

**M. Apple, Ltd.**—Leo Graham, C.A., of 46a, Finsbury Square, E.C., was appointed receiver and manager on July 16th, 1940, under powers contained in debenture dated June 5th, 1940.

### Company Liquidations

**Long & Carter, Ltd.**, electrical contractors, High Street, Wickford, Essex.—The statutory meeting of creditors was held recently at Rayleigh, when a statement of affairs was submitted showing liabilities of £341 and net assets of £305, leaving a deficiency, as regarded the creditors, of £36. The issued capital was £1,300, and so far as the contributories were concerned there was a deficiency of £1,336. A resolution was passed confirming the voluntary liquidation of the company with Mr. B. W. Vincent, of Southend-on-Sea, as liquidator.

**Allgoods Agencies, Ltd.**, electrical wholesalers, Tempest Hey, Liverpool.—The statutory meeting of creditors was held on July 15th at the offices of Mr. P. S. Booth, 5, Rumford Place, Liverpool, when Mr. T. P. McGrath, a director of the company, occupied the chair and reported that the shareholders had previously met and passed the necessary resolution for voluntary liquidation, and had nominated Mr. Booth to act as liquidator. The statement of affairs disclosed liabilities of £707, against assets estimated to realise £125, leaving a deficiency, as regarded the creditors, of £582. The liabilities included a sum of £126 due to Mr. McGrath, but it was stated that that claim would be withdrawn. The issued capital was £200, and so far as the shareholders were concerned there was a deficiency of £782. A resolution was passed confirming the appointment of Mr. P. S. Booth as liquidator of the company, and a committee was also appointed.

### Bankruptcy Proceedings

**J. K. Thornborough**, 7, Finlay Close, Kendal, Westmorland, and **E. C. Thornborough**, 17, Oak Street, Windermere, Westmorland, lately carrying on business in co-partnership at Crescent Road, Windermere, under the style or firm of J. K. Thornborough and Co., electricians.—The public examination was held at the Court House, Town Hall, Kendal, recently. According to the joint statement of affairs filed there were gross liabilities of £2,751 of which £687 was expected to rank for dividend, with assets of £396. The examination was closed subject to the signing of the notes.

**T. Riley**, The Haven, Boundary Lane, Mossley, Congleton, lately carrying on business at 58, Station Road, Tunstall, Stoke-on-Trent, electrical contractor.—The public examination was held at the Town Hall, Macclesfield, recently, when a statement of affairs showed a deficiency of £956. Debtor attributed his failure to bad debts, illness of his first wife, and the 1938 war scare. The examination was formally closed.

**F. E. Walton**, electrical engineer, Island Hotel, Eel Pie Island, Twickenham, Middlesex.—Last day for receiving proofs for dividend, July 30th. Trustee, Mr. R. Betts, 29, Russell Square, London, W.C.1.

**M. Franks**, electrical and radio engineer, 4, Bayford Road, Littlehampton, lately trading at Arcade Road, Littlehampton.—First and final dividend of 9d. in the £, payable July 29th at 185-188, High Holborn, London, W.C.1.

**E. G. Gentle**, electrician, 21, Stanley Street, Bedford,—Receiving order made July 15th on debtor's own petition. First meeting July 30th at 6, The Parade,

Northampton. Public examination September 17th at the Shire Hall, Bedford.

**J. A. N. B. Tanner**, electrical engineer, 3, Jubilee Buildings, Pakefield, Lowestoft.—Trustee, Mr. A. E. Attwood, Finsbury Chambers, 76, Finsbury Pavement, London, E.C.2, released June 20th.

**H. M. Brown** (Wood & Co.), electrical engineer, 97, St. Helen's Street, Ipswich.—Trustee, Mr. J. B. Sanderson, 17, Museum Street, Ipswich, released July 5th.

**R. S. Barlow**, electrical contractor and radio dealer, Chapel Lane, Spalding, Lincs.—Trustee, Mr. A. Sutcliffe, Queen Street Chambers, Peterborough, released April 18th.

# Reports and Dividends

**The General Electric Co., Ltd.,** held its annual meeting on July 18th, when Lord Hirst (chairman and managing director), in reviewing the accounts, said that the increased activity at their works, conducted at higher prices both for labour and material, necessitated additional finance, and £1,000,000 had been provided by way of loan, while since March 31st a further £1,000,000 had been added to the loan. Having regard to the fact that this finance was required to cover their war efforts and, to some extent, therefore, must be of a temporary character, they felt it best to arrange a five-year loan which they could repay any time at a small premium rather than make an issue of permanent capital at a time when shareholders might find it impossible to take up their quota and when all their savings should be put behind the national effort.

Referring to the increase in the amount applied to depreciation, Lord Hirst said that since the war started many of their factories had been working day and night to provide the Government's requirements, and the life of the machinery involved must be shortened, and an adequate allowance must be made which he hoped the Government would recognise, too, from the taxation standpoint.

They had to find a certain amount of finance for their electric supply business through their holding company, the Electric Development & Securities Trust, Ltd. This company was continuing its steady progress and now covered 41,600 consumers, an increase of 9 per cent., and yielded a modest return on the capital invested. The purchase price paid by the Macclesfield Corporation for the undertaking there was utilised towards repaying the loan from outside sources which fell due for repayment.

It would be understood that, in the circumstances, it was impossible to give an account of their various technical achievements and successes until the war was over, but when the time arrived stockholders would be proud to hear of the work they had carried out for the Admiralty, the War Office, the Air Force and the Ministry of Supply, as well as the Defence Services. In all these activities their research laboratories had continued to play their part.

The company's works, which covered the whole field of activity from heavy engineering to communications and all the light industries, were engaged to the fullest extent with all their designing and manufacturing experience and all their varied manufacturing capacity in helping to supply the fighting Services. Yet, in spite of all these preoccupations on national work, they had managed to maintain their export business, which was equally vital for the success of the country's war effort. From all their overseas markets, which were predominantly in the British Empire, they had received letters of congratulation at the flow of exports they had succeeded in maintaining. They had to-day on their payroll 42,415 workers, and, in addition, 3,000 men were serving with the Forces.

Lord Hirst concluded by paying tribute to the work of Mr. M. J. Railing, joint managing director, who had, during his absence through illness, taken the full responsibility of steering the company through the difficulties of the past year.

Mr. Railing, in seconding the motion for the adoption of the report and accounts, said that at each of their many works they were working day and night to full capacity in order to achieve the utmost production of equipment for the various Services. Their help was sought and readily given in all sorts of directions not connected with their normal work, and in the solution of problems and the management of factories not directly connected with the electrical industry. The Government had entrusted them with the responsibility of managing a number of "shadow" factories, and in them, as with their other factories, they were, day by day, increasing output and speeding up the production of vital necessities for the conduct of the war.

**The Engineering & Lighting Equipment Co., Ltd.**—Presiding at the first ordinary general meeting on July 22nd Mr. S. A. Marples (chairman) recalled that at the statutory meeting in October last he had said that he felt they would at least be able to congratulate themselves when they next met upon a real contribution to the national endeavour. That contribution had been made and every effort would be made still further to augment it.

The nature and extent of their part could not be referred to in detail, but it had covered a wide range of productions and called for continuous exertion, not only to speed up deliveries, but to provide in an unusual degree for new and special requirements. If they added the necessity to provide for efficient A.R.P. and first-aid services and shelters, to ensure adequate supplies of material, largely special types, the adaptation of and additions to plant, the provision for black-out, camouflage, protection from fire and numerous other wartime necessities, shareholders would appreciate that the load and responsibility that fell upon the managing director and his staff had been exceptionally heavy. As all that had had to be carried out concurrently with production, it was a matter for congratulation that they could report an increase in turnover for the year.

**Ward & Goldstone, Ltd.,** report a net revenue for the year to March 31st of £108,391, as compared with £73,921 for 1938-39. From this the following deductions are made:—Employees' provident scheme, £500; directors' fees, £600; income tax, £20,952; E.P.T., £30,000; depreciation, £13,890. The final ordinary dividend is 10 per cent., again making 20 per cent. General reserve receives £10,000, and £30,211 is carried forward (against £16,575 brought in).

The speech, to be delivered by Mr. M. H. Goldstone (chairman) at the annual meeting on July 30th, has been circulated in advance. In this Mr. Goldstone says that the retention of the major part of the profits during past years for the purpose of expansion now enables them by reason of increased production, to make a noteworthy contribution to the war effort, largely to increase their valuable export trade and to carry on such home trade as circumstances permit.

During the year extensions and plant came into operation and are providing a useful additional quota to the output. During the greater part of the year the major proportion of the turnover was on account of home and export trade and a minor part for Government requirements; the position now is entirely reversed. The turnover of the company effort, largely to increase their valuable export trade and to carry on such home include many new lines.

**The Victoria Falls & Transvaal Power Co., Ltd.**—Presiding at the annual meeting on July 23rd Mr. A. E. Hadley (chairman and managing director) in reviewing the report and accounts for the past year, said that the load increased during the year by 12 per cent., and amounted to a maximum for electricity and air of 651,500 kW. When the war broke out they had in hand large contracts for extensions to the generating and transmission plants required to meet the further development of the gold mining industry. Every effort was being made to ensure that this work maintained its place with other work of similar national importance, and up to the present progress had been as good as could have been expected.

**Broadcast Relay Service, Ltd.,** reports a trading profit for the year ended March 31st of £131,034 as compared with £91,062 for the preceding year, and a net profit of £69,279 (against £48,739). The dividend on the £300,000 5½ per cent. redeemable cumulative preference shares takes £8,304. Two-thirds of this issue was made just over a year ago, and the remainder (with £50,000 ordinary shares) last March. It is proposed to pay a final dividend of 5 per cent., making 10 per cent. for the year (against 12½ per cent.), and to carry forward £18,693, an increase of £11,830.

It is proposed to increase the authorised capital by £250,000 to £1,250,000. Of the new capital, £200,000 will be 5½ per cent. redeemable cumulative preference shares. The remainder may be issued either as ordinary shares or with such preferred, deferred or other special rights or such restrictions whether in regard to dividend, return of capital, voting or otherwise, as the directors may from time to time determine. The issued ordinary shares are to be converted into stock. The necessary resolution will be submitted at the annual meeting on August 14th.

**The Nigerian Electricity Supply Corporation** reports a net trading profit for the year to February 29th of £49,209, an increase of £21,368, as compared with 1938-39. Taxation provision absorbs £16,400 and debenture interest £13,868. Debenture stock discount and reorganisation expenses have been written off and £10,398 is transferred to reserve. The balance carried forward is £6,871 (against £2,791 brought in).

**Mid-Lincolnshire Electric Supply Co., Ltd.,** reports a net profit for 1939 of £60,668, as compared with £51,008 in the previous year, plus £2,081 brought in. The final ordinary dividend is 5 per cent., making 8 per cent. for the year (same), and £4,436 is carried forward.

**Bennis Combustion, Ltd.,** reports net profits for the year to April 30th of £29,371, as compared with £25,968 for the preceding year. Income tax and E.P.T. require £8,000, general reserve receives £6,000, and the staff benevolent fund £2,000. The final dividend is 5 per cent., maintaining the distribution for the year at 10 per cent., and £3,216 is carried forward (against £3,344 brought in).

**Dictograph Telephones Ltd.,** has declared an interim ordinary dividend of 5 per cent., less tax. No interim was paid last year, but a total distribution of 7 per cent. was made for the twelve months.

**Thomas Bolton & Sons, Ltd.,** report a net profit for the year ended March 31st of £128,871, as compared with £64,108 for the preceding year. War contingencies reserve receives £30,000 and taxation reserve £30,000. The final ordinary dividend is 7½ per cent., making 10 per cent. for the year (against 7½ per cent.), and £58,991 is carried forward (against £55,120 brought in).

**Chadburn's (Ship) Telegraph Co., Ltd.,** report a profit for the year to March 31st of £7,848, as compared with £11,694 for the preceding year. Reserve receives £2,000 and war contingencies £1,000. The dividend for the year is 6 per cent., and a bonus of 6½ per cent. is paid (same); £5,946 is carried forward (against £5,786 brought in).

**W. & T. Avery, Ltd.,** report a trading profit for the year ended March 31st of £207,715, as compared with £221,367 for the previous year, and a net profit of £151,098 (against £165,348). The final ordinary dividend is 10 per cent., making 15 per cent. for the year (unchanged), reserve receives £30,000, pensions £10,000, and contingency (war) reserve £25,000. The balance carried forward is £65,207 (against £70,890 brought in).

**Pye, Ltd.,** proposes to pay a dividend on the deferred ordinary stock of 25 per cent., less tax, for the year ended March 31st, the same rate as for the preceding year. The preferred ordinary shares again receive their maximum 10 per cent. for the year. The net profit for the year was £105,000 (against £78,079 for 1938-39).

**The Anglo-American Telegraph Co.** is paying a quarterly interim dividend of ¾ per cent. (same).

**The London Electrical & General Trust** has announced a final ordinary dividend of 3½ per cent., making 5½ per cent. (same).

**The Metropolitan Electric Supply Co., Ltd.,** has declared an interim dividend of 3 per cent. (unchanged).

**The London Electric Supply Corporation, Ltd.,** is again paying an interim dividend of 3 per cent.

**Mather & Platt, Ltd.,** have declared an interim dividend of 4 per cent. (same).

# STOCKS AND SHARES

TUESDAY EVENING.

THE Chancellor of the Exchequer did not introduce his Budget this Tuesday afternoon until after the Stock Exchange markets had finished for the day. Therefore the effect of his proposals is not reflected in the current price-lists, though in all probability it will be found that the Stock Exchange markets had discounted in advance the extra taxation which Sir Kingsley Wood imposes. Income-tax had been talked up to 10s., so that 8s. 6d. will be considered not too bad.

The general trend of markets has been steady, as the comparatively small number of alterations in our price-lists goes to show. A feature of the last day or two has been a considerable rise in the prices of Home Railway stocks on anticipatory hopes of what the companies will declare in the way of dividends on Friday in this week. The Southern Railway stocks have participated with the rest. After falling to 42, Southern Railway preferred spurted to 47, and the company's 5 per cent. preference stock, at 76, is 4 points higher. No change has occurred in London Passenger Transport "C." The "A" stock is a point to the good at 107.

## Gilt-edged Hesitation

So long as the present issue of 2½ per cent. National War Bonds remains on tap at 100, so long will this set an approximate standard of value for gilt-edged stocks of all kinds. To some extent, the Treasury receives adventitious aid in the popularising of these bonds through the caution with which British corporation stocks are now regarded. The stocks of the towns from which large numbers of the populations have departed have temporarily lost that prestige which had been theirs for many years.

Some of the corporation stocks are difficult to sell. Up to the present, the securities of the Central Electricity, the London Passenger Transport, and other Boards, have mostly escaped inclusion in the list of those which the buyer declines to consider. The stocks are protected by minimum prices but this does not mean, of course, that buyers can always be found at those figures.

## General Electric

Lord Hirst, at last week's annual meeting of the General Electric Company, made a noteworthy contribution to chairmen's speeches of the day. As the G.E.C. showed record profits for the year reviewed, Lord Hirst had a pleasanter task than that which falls to the lot of many chairmen just now. He referred to the effort which the electrical industry as a whole is putting forth in the national cause, and, turning to his own Company, the General Electric, he said it was working to its fullest capacity. Not only was every effort bent upon the work at home, but the export side of the business, so vital to this country, had been maintained. Payment of the 20 per cent. dividend on the ordinary shares is shown by the recently published accounts to be comfortably covered. The price of the shares is unchanged at 66s. 3d.: the 6½ per cent. preference shares continue in demand, and are 6d. higher at 28s. 9d.

The General Electric Company has borrowed two million pounds in order to cover the cost of its war efforts, and Lord Hirst gave two reasons why this had been done instead of the money being raised by an issue of permanent capital. First, the company's shareholders might find it impossible just now to take up their quota of new capital; and secondly, they, the proprietors, might desire to put all their savings behind the national effort. The explanations of the Board's decision are reasonable and justifiable. It would be no matter for surprise, however, if a shareholder, while acquiescing in the wisdom of a temporary loan, should feel a measure of curiosity as to what terms might have been offered if the company's directors had gone to their fellow proprietors with a request for the money.

## Dividends

Tilling and British Automobile Traction shares are 2s. 6d. down at 45s. on the announcement of an interim dividend of 3½ per cent. tax free, as against 4 per cent. tax free a year ago. For the full year, the dividend was made up to 8 per cent. free of tax, and the slight reduction in the present interim dividend is taken as a hint that the final may also be lowered because of the higher income-tax now in force. The Tilling & B.A. Company runs a number of motor services in various parts of the country, these being associated with the four main-line railways. The company is under the control of British Electric Traction and Thomas Tilling, Ltd. Tilling shares are unchanged at 31s. 3d.

Ward & Goldstone, makers of cable and electrical accessories, recently declared a dividend making 20 per cent.—the same as that for the previous year—on the 5s. shares, and the figures now published make satisfactory reading, the carry-forward of £30,000 being £13,500 up on the year. The price of the shares at 12s. 6d. has recovered the dividend. Although the official quotation is 12s. 6d. to-day, the last recorded business was at 19s. 9d., a bargain at that price having been done on Janury 2nd.

## Anglo-American Telegraph

The Anglo-American Telegraph Company has declared the usual quarterly dividend of 15s. per cent. on its ordinary stock, but this has failed to revive the price of the company's 6 per cent. preferred ordinary, which continues dull at 86 xd. At this price the yield on the money is virtually 7 per cent.; a good return for a stock of this nature. Twenty-nine years ago the company leased the whole of its undertaking to the Western Union Company for 99 years from April 1st, 1911, at a rental sufficient to provide 3¾ per cent. on the ordinary stock, 6 per cent. on the preferred and 1½ per cent. on the deferred. The ordinary stock is now no more than £213,760, but both the preferred and the deferred amount to £3,393,120, making up £7,000,000 altogether. The earnings for the Western Union Company have shown themselves, so far, more than sufficient to cover the required rental to pay the Anglo-American Telegraph Company.

Anglo-American preferred was standing at 105 a few weeks ago but has now come down by 19 points, the decline being due, according to market opinion, more to general conditions than to any particular pressure to sell the stock.

## "Political Apprehensions"

Last week's abrupt fall in the ordinary shares of the Anglo-Portuguese Telephone Company came about as the direct result of political apprehensions. Briefly stated, these refer to the fear that Germany, having secured so large a part of the coast line from Northern France to the Mediterranean, may cast covetous eyes upon Portugal. Exaggerated as this theory may appear, the fact remains that Anglo-Portuguese Telephone shares, which were standing at £1 not long ago, have been changing hands at 10s., in spite of the recent publication of an excellent report and balance sheet. The dividend of 8 per cent., which has been paid annually for many years past, was repeated. The company occupies a strong financial position and for anyone who has sufficient courage to invest money in a Portuguese industrial concern, the shares offer temptation by reason of the high yield they afford at the current figure. The chairman is Sir Alexander Roger.

## British Aluminium

British Aluminium ordinary have further fallen to 30s. The company is one of the largest producers of aluminium in the world. It owns extensive deposits, in Europe and the British Empire, of bauxite, the ore from which aluminium is produced. The Company has chemical factories for the refining of this ore and other purposes in Norway. In addition, it possesses interests, as mentioned last week, in France. The present position is, of course, very obscure. The 6 per cent. preference shares, of which there were anxious buyers at 27s. 6d. a fortnight ago, are now quoted about 3s. 6d. lower.

## Miscellaneous Matters

Telegraph Constructions, at 30s., and Westinghouse Brake, at 32s. 6d., are both half a crown down. On the other hand, Johnson & Phillips improved by 1/6 to 35s., and English Electrics, at 22s. 6d., gained a similar fraction. In the Iron and Steel group Vickers, at 11s. 9d., have fallen 1s. and now return 8½ per cent. on the money, assuming maintenance of the 10 per cent. dividend. West Riding shares went back 4s. to 26s., there being some pressure to sell, presumably on air-raid possibilities. Electricity supply shares show few changes. Notting Hill preference are a further 10s. down, at 9. Scottish Power are a little better and Victoria Falls Power slightly easier at 27s. 6d. and 60s. respectively. Globe Telegraph ordinary shares at 23s. 9d. are 1/6 lower. The Cable and Wireless trio maintains the previous prices. Automatic Telephones are wanted: the ordinary and the A shares are better at the common price of 37s. 6d.

## Wartime Risks

Stock Exchange securities are usually held in one of two shapes—bearer or registered. Other variations there are, but they are mostly related to one or other of the two mentioned. Custom and temperament combine to make the registered class by far the more popular, but War Loan, Consols and many other stocks and shares can be in bonds to bearer. In view of air-raid risks—to say nothing of invasion—the holder of bearer securities may be strongly urged to convert these without delay into registered or inscribed. In some cases, only bonds to bearer are issued, but in most, the alternative of registration or inscription is available, and where this applies, advantage should be taken of it. Loss of a certificate of registered shares can lead to inconvenience, but loss of bearer bonds will entail costly and lengthy consequences the risk of which is not worth the acceptance, in wartime, by investors to whom an alternative in the shape of registration of their holdings is provided.

## Concessions to the Seller

The position is peculiar of the holder in this country of securities that come within the British Treasury's orbit. As set out here last week, there are ten different issues quoted in our lists which are governed by the prices of June 17th last. Within the last few days, an Order in Council has given permission for these to be sold to residents outside this country. The proprietor of American Telephone and Telegraph shares, for example, is no longer forbidden to sell them, provided that the purchaser is a non-resident here. If a British resident wishes to buy such shares, he is not allowed to do it. He may only sell. This latter is a concession, it is true, and anything that tends to the release of restriction is welcome when it can be effected without any risk of the enemy drawing advantage from it. From the material standpoint of business in stocks and shares, it has to be confessed that the existence of a market, in the proper sense of that word, must obviously depend upon facilities for both selling and buying—not for one of these sides only.

# ELECTRICAL COMPANIES' SHARES

## Prices, Dividends and Yields

| Company | 1940 Highest | 1940 Lowest | Dividend Previous | Dividend Last | Middle Price July 23 | Rise or Fall | Yield £ s. d. |
|---|---|---|---|---|---|---|---|
| **Home Electricity Companies** | | | | | | | |
| Bournemouth and Poole | 63/6 | 42/6 | 15 | 15 | 42/6 | ... | 7 1 2 |
| British Power and Light | 30/– | 21/– | 7 | 7 | 21/– | ... | 6 13 4 |
| City of London | 28/– | 20/– | 7½ | 7½ | 20/– | ... | 7 10 0 |
| Clyde Valley | 38/6 | 25/– | 8 | 8 | 28/9 | ... | 5 11 4 |
| County of London | 43/3 | 22/– | 10½ | 10½ | 25/– | ... | 8 8 0 |
| Edmundson's: | | | | | | | |
| 7% Pref. | 31/6 | 26/3 | 7 | 7 | 26/3 | ... | 5 6 8 |
| Ord. | 27/6 | 18/6 | 9 | 6 | 20/6 | ... | 5 17 1 |
| Elec. Dis. Yorkshire | 40/3 | 32/6 | 9 | 9 | 32/6 | ... | 5 10 9 |
| Elec. Fin. and Securities | 41/3 | 38/6 | 12½ | 12½ | 38/9 | ... | 6 9 0 |
| Elec. Supply Corporation | 46/3 | 38/6 | 12 | 11½ | 38/9 | ... | 5 18 7 |
| Isle of Thanet | 16/– | 5/6 | 4 | 4 | 6/– | ... | 13 6 8 |
| Lancs Light and Power | 33/– | 25/– | 7½ | 7½ | 25/– | ... | 6 0 0 |
| Llanelly Elec. | 21/– | 17/0 | 5½ | 5½ | 18/– | ... | 6 2 2 |
| Lond. Assoc. Electric | 21/– | 12/6 | 7 | 5½ | 13/3 | ... | — |
| London Electric | 37/6 | 19/– | 8 | 7 | 20/– | ... | 7 5 0 |
| London Power Deb. Red. | 105½ | 102 | 5 | 5 | 101½ | ... | 4 18 6 |
| Metropolitan | 41/6 | 23/6 | 12 | 10 | 25/– | ... | 8 0 0 |
| Midland Counties | 39/– | 24/3 | 8 | 8 | 26/3 | ... | 6 2 0 |
| Mid. Elec. Power | 40/– | 29/6 | 9 | 9 | 30/– | ... | 6 0 0 |
| Newcastle Elec. | 29/9 | 24/6 | 7 | 7 | 24/6 | ... | 5 14 3 |
| North Eastern Electric: | | | | | | | |
| Ordinary | 31/6 | 17/6 | 7 | 7 | 20/– | ... | 7 0 0 |
| 7% Pref. | 32/6 | 27/6 | 7 | 7 | 27/6 | ... | 5 1 10 |
| Northampton | 48/– | 40/– | 10 | 10 | 40/– | ... | 5 0 0 |
| Notting Hill 6% Pref. (£10) | 10½ | 10 | 6 | 6 | 9 | –½ | — |
| Northmet Power: | | | | | | | |
| Ordinary | 42/3 | 23/– | 10 | 10 | 25/– | ... | 8 0 0 |
| 6% Pref. | 29/– | 23/– | 6 | 6 | 26/– | ... | 4 12 4 |
| Richmond Elec. | 24/6 | 18/– | 7 | 6 | 20/– | ... | 6 0 0 |
| Scottish Power | 38/– | 24/– | 8 | 8 | 27/6 | +⅛ | 5 16 4 |
| Southern Areas | 21/3 | 13/9 | 5 | 5 | 13/9 | ... | 7 5 6 |
| South London | 23/3 | 20/– | 7 | 7 | 20/– | ... | 7 0 0 |
| West Devon | 20/– | 18/6 | 5 | 5 | 20/– | ... | 5 0 0 |
| West Glos. | 21/3 | 15/– | 2½ | 4½ | 16/3 | ... | 5 13 10 |
| Yorkshire Elec. | 40/– | 24/6 | 8 | 8 | 27/6 | ... | 5 16 5 |
| **Overseas Electricity Companies** | | | | | | | |
| Atlas Elec. | 4/– | 1/3 | Nil | Nil | 1/6 | ... | — |
| Calcutta Elec. | 37/– | 22/6 | 10* | 8* | 25/6 | ... | 6 8 0 |
| Cawnpore Elec. | 30/– | 24/– | 10 | 10 | 25/– | ... | 8 0 0 |
| East African Power | 25/6 | 20/– | 7 | 7 | 20/– | –⅛ | 7 0 0 |
| Jerusalem Elec. | 24/– | 18/– | 7 | 7 | 20/– | ... | 7 0 0 |
| Kalgoorlie (10/–) | 12/6 | 9/6 | 7½ | 7½ | 11/6 | ... | 6 10 5 |
| Madras | 26/9 | 25/– | 8* | 6* | 25/– | ... | 4 16 0 |
| Montreal Power | 35½ | 30 | 1½ | 1½ | 32 | ... | — |
| Palestine Elec. "A" | 25/– | 17/– | 5* | Nil | 17/6 | ... | — |
| Perak Hydro-electric | 20/3 | 13/6 | 6 | 2½ | 13/9 | ... | 3 12 9 |
| Shawinigan Power | 27½ | 19 | 83cts. | 90cts. | 20½ | ... | — |
| Tokyo Elec. 6% | 69 | 52 | 6 | 6 | 52½ | ... | 11 8 6 |
| Victoria Falls Power | 75/9 | 56/– | 15 | 15 | 60/– | –⅛ | 5 0 0 |
| Whitehall Investments Pref. | 17/9 | 8/– | 7½ | 7½ | 9/6 | +6d. | 15 16 0 |
| **Public Boards** | | | | | | | |
| Central Electricity: | | | | | | | |
| 1950–70 | 110½ | 104 | 5 | 5 | 104½ | ... | 4 15 8 |
| 1955–75 | 112½ | 106 | 5 | 5 | 106½ | ... | 4 14 0 |
| 1951–73 | 107½ | 102 | 4½ | 4½ | 102½ | ... | 4 7 10 |
| 1963–93 | 96½ | 90 | 3½ | 3½ | 91½ | ... | 3 16 6 |
| London Elec. Trans Gtd. | 92 | 87½ | 2½ | 2½ | 89 | ... | 2 16 2 |
| London & Home Counties | | | | | | | |
| 1955–75 | 113¼ | 105 | 4½ | 4½ | 105½ | ... | 4 5 4 |
| Lond. Passenger Transport | | | | | | | |
| A | 116 | 104 | 4½ | 4½ | 107 | +½ | 4 4 0 |
| B | 116 | 102½ | 5 | 5 | 104½ | ... | 4 15 8 |
| C | 65½ | 25 | 1½ | ... | 30 | ... | — |
| West Midland Joint Elec. | | | | | | | |
| 1948–68 | 106½ | 105 | 5 | 5 | 105½ | ... | 4 14 9 |
| **Telegraph and Telephone** | | | | | | | |
| American Tel. & Tel. | 215 | 180 | 9 | 9 | 190 | ... | 4 14 9 |
| Anglo-Am. Tel.: | | | | | | | |
| Pref. | 106 | 85 | 6 | 6 | 86xd | –1½ | 6 19 6 |
| Def. | 23⅜ | 18½ | 1½ | 1½ | 19½ | –2 | 7 14 0 |
| Anglo-Portuguese | 22/6 | 10/– | 8 | 8 | 11/3 | ... | 14 4 6 |
| Cable & Wireless: | | | | | | | |
| 5½% Pref. | 99½ | 70 | 4½ | 5½ | 75½ | ... | 7 17 2 |
| Ord. | 65 | 28½ | 4 | 4 | 36 | ... | 11 2 2 |
| Income | 99½ | 93 | ... | ... | 96 | ... | 4 3 4 |
| Canadian Marconi $1 | 6/– | 4/– | Nil | 4cts. | 4/3 | ... | — |
| Globe Tel. & Tel.: | | | | | | | |
| Ord. | 32/6 | 21/6 | 7½* | 6* | 23/9 | –⅛ | 5 1 1 |
| Pref. | 22/9 | 22/6 | 6 | 6 | 23/9 | ... | 5 1 1 |
| Great Northern Tel. (£10) | 20 | 11 | 20 | 20 | 12½ | ... | — |
| Inter. Tel. & Tel. | 5½ | 3 | Nil | Nil | 3 | ... | — |
| Marconi-Marine | 30/– | 18/6 | 10 | 7½ | 18/9 | ... | 8 0 0 |
| Oriental Telephone Ord. | 2⅞ | 49/6 | 12* | 11½* | 2½ | ... | 4 12 0 |
| Telephone Props. | 15/– | 12/6 | 5 | 6 | 12/6 | ... | 9 12 0 |
| Telephone Rentals (5/–) | 9/6 | 5/9 | 10 | 10 | 5/9 | –6d. | 8 14 0 |
| **Traction and Transport** | | | | | | | |
| Anglo-Arg. Trams: | | | | | | | |
| First Pref. (£5) | 4/3 | 1/3 | Nil | Nil | 2/– | ... | — |
| 4% Inc. | 11½ | 2 | Nil | Nil | 3½ | ... | — |
| British Electric Traction | | | | | | | |
| Def. Ord. | 830 | 440 | 5 | 45 | 500 | ... | 9 0 0 |
| Pref. Ord. | 169 | 134 | 8 | 8 | 140 | ... | 5 14 3 |
| Bristol Trams | 48/6 | 1⅞ | 10 | 8* | 35/– | ... | — |
| Brazil Traction | 12½ | 5½ | $1 | 50c. | 5½ | ... | — |
| Calcutta Trams | 24/– | 20/– | 8 | 5½ | 20/– | ... | 5 10 0 |
| Cape Elec. Trams | 18/6 | 16/– | 5 | 5 | 18/– | ... | 5 11 1 |
| Lancs Transport | 35/– | 28/3 | 10 | 10 | 30/– | ... | 6 13 4 |
| Mexican Light: | | | | | | | |
| 1st Bonds | 33 | 27 | 5 | 5 | 27½ | ... | — |
| Rio 5% Bonds | 90 | 74 | 5 | 5 | 80 | ... | 6 5 0 |
| Southern Rly.: | | | | | | | |
| 5% Prefd. | 79 | 35 | 5 | 5 | 47 | +3 | 10 12 10 |
| 5% Pref. | 104½ | 60 | 5 | 5 | 76 | +4 | 6 11 7 |
| T. Tilling | 45/9 | 31/– | 10 | 10 | 31/3 | ... | 6 8 0 |
| Tilling & B.A. | 47/6 | 43/9 | 9* | 8* | 45/– | –½ | — |
| West Riding | 35/– | 26/– | 10 | 10 | 26/– | –4/– | 7 14 0 |
| **Equipment and Manufacturing** | | | | | | | |
| Aron Electricity Ord. | 17/6 | 15/– | 15 | 15 | 15/– | –½ | — |
| Assoc. Elec.: | | | | | | | |
| Ord. | 43/3 | 27/– | 10 | 10 | 33/9 | –9d. | 5 18 6 |
| Pref. | 35/3 | 32/3 | 8 | 8 | 33/9 | ... | 4 14 10 |
| Automatic Telephone & El. | 47/3 | 32/– | 12½ | 12½ | 37/6 | +½ | 6 13 4 |
| Babcock & Wilcox | 50/– | 28/6 | 10 | 11 | 32/6 | ... | 6 15 4 |
| British Aluminium Ord. | 56/– | 38/9 | 12½ | 12½ | 30/0 | –1/8 | 8 6 8 |
| British Insulated Ord. | 92/6 | 67/– | 20 | 20 | 72/6 | ... | 5 10 3 |
| British Thermostat (5/–) | 14/9 | 6/6 | 18½ | 18½ | 7/– | ... | 13 4 4 |
| British Vacuum Cleaner (5/-) | 12/6 | 8/– | 40 | 12½ | 10/– | ... | 6 5 0 |
| Brush Ord. | 4/6 | 2/– | Nil | Nil | 2/6 | ... | — |
| Callender's | 69/– | 46/– | 15 | 15 | 50/– | ... | 6 0 0 |
| Chloride Elec. Storage | 72/6 | 65/– | 15 | 15 | 3 | ... | 4 16 0 |
| Consolidated Signal | 72/6 | 59/– | 36½ | 17 | 65/– | ... | 5 4 7 |
| Crabtree (10/–) | 24/9 | 17/6 | 17½ | 17½ | 20/– | ... | 8 15 0 |
| Crompton Parkinson: | | | | | | | |
| Ord. (5/–) | 20/– | 12/6 | 30 | 20 | 12/6 | ... | 8 0 0 |
| E. K. Cole (5/–) | 5/– | 2/6 | 10 | Nil | 3/0 | +3d. | — |
| Elec. & Musical Industries (10/–) | 10/3 | 4/3 | 5 | Nil | 5/9 | ... | — |
| Electric Construction | 36/3 | 30/– | 13½ | 10 | 30/– | ... | 6 13 4 |
| Enfield Cable Ord. | 56/– | 40/6 | 25 | 16½ | 42/6 | ... | 7 13 0 |
| Electrical Switchgear (10/–) | 22/6 | 20/– | 16 | 10 | 20/– | ... | 5 0 0 |
| English Electric | 33/9 | 16/6 | 10 | 10 | 22/6 | +⅛ | 8 18 0 |
| Ensign Lamps (5/–) | 15/3 | 13/9 | 25 | 25 | 13/9 | ... | 9 1 10 |
| Ericsson Tel. (5/–) | 39/3 | 25/– | 25* | 25* | 25/– | ... | 5 0 0 |
| Ever Ready (5/–) | 28/3 | 17/3 | 30 | 40 | 20/6 | ... | 9 15 2 |
| Falk Stadelmann | 18/3 | 12/6 | 10 | 6 | 12/6 | ... | 9 12 0 |
| Ferranti Pref. | 25/– | 23/– | 7 | 7 | 25/– | ... | 5 12 0 |
| G.E.C.: | | | | | | | |
| Pref. | 32/6 | 27/– | 6½ | 6½ | 28/9 | +6d. | 4 10 6 |
| Ord. | 83/3 | 56/– | 20 | 20 | 66/3 | ... | 6 0 10 |
| Greenwood & Batley | 25/6 | 20/– | 15 | 13 | 20/– | ... | 6 10 0 |
| Hall Telephone (10/–) | 18/6 | 11/– | 15 | 10 | 11/3 | ... | — |
| Henley's (5/–) | 21/6 | 13/6 | 20 | 20 | 15/– | ... | 6 13 4 |
| 4½% Pref. | 21/3 | 20/6 | 4½ | 4½ | 21/3 | ... | 4 4 8 |
| Hopkinsons | 46/9 | 35/– | 12½ | 15 | 33/9 | ... | 8 17 10 |
| India-Rubber Pref. | 21/– | 20/– | 5½ | 5½ | 20/9 | ... | 5 6 0 |
| Intl. Combustion | 121/3 | 73/6 | 32½ | 32½ | 3⅜ | ... | 8 13 6 |
| J. Lucas | 60/6 | 40/– | 15 | 15 | 42/6 | ... | 7 1 2 |
| Johnson & Phillips | 50/9 | 33/– | 12½ | 15 | 35/– | +⅛ | 8 11 6 |
| Lancashire Dynamo | 59/9 | 47/6 | 25 | 20 | 47/6 | ... | 8 8 5 |
| Laurence Scott (5/–) | 11/– | 7/– | 15 | 15 | 8/– | ... | 9 7 6 |
| London Elec. Wire | 25/6 | 24/6 | 12 | 7½ | 25/– | ... | 6 0 0 |
| Mather & Platt | 46/6 | 30/– | 13½ | 10 | 31/– | ... | 6 9 1 |
| Metropolitan Elec. Cable Pf. | 22/– | 21/3 | 5½ | 5½ | 21/3 | ... | 5 3 6 |
| Murex | 86/9 | 52/6 | 20 | 20 | 65/– | ... | 6 3 9 |
| Pye Deferred (5/–) | 9/– | 6/9 | 25 | 25 | 7/– | ... | 14 0 8 |
| Revo (10/–) | 20/9 | 12/6 | 17½ | 5 | 12/6 | ... | 8 0 0 |
| Reyrolle | 60/6 | 41/– | 12½ | 12½ | 41/– | ... | 5 17 8 |
| Siemens Ord. | 23/9 | 16/3 | 7½ | 7½ | 16/3 | ... | 9 4 8 |
| Strand Elec. (5/–) | 2/3 | 9d. | 10 | 4 | 1/3 | ... | 10 0 0 |
| S. Smith (1/–) | 8/– | 3/6 | 37½ | 50 | 3/9 | ... | 13 6 8 |
| Switchgear & Cowans (5/–) | 11/9 | 5/6 | 20 | 10 | 6/3 | ... | 8 10 0 |
| Telegraph Condenser (10/–) | 8/9 | 6/3 | 5 | — | 8/9 | ... | — |
| Telegraph Construction | 42/6 | 29/– | 10 | 10 | 30/0 | –½ | 6 13 4 |
| Telephone Mfg. (5/–) | 9/– | 5/– | 9 | 9 | 5/3 | –3d. | 8 11 6 |
| Tube Investments | 96/9 | 61/3 | 23¾ | 23¾ | 71/3 | ... | 6 14 0 |
| Vactric (5/–) | 3/6 | 2/– | 4 | Nil | 2/6 | ... | — |
| Vickers (10/–) | 22/– | 9/6 | 10 | 10 | 11/9 | –1/– | 8 10 2 |
| Ward & Goldstone (5/–) | 19/9 | 12/6 | 20 | 20 | 12/6xd. | +6d. | 8 0 0 |
| Westinghouse Brake | 46/– | 32/9 | 17½ | 10 | 32/6 | –½ | 6 3 1 |
| Walsall Conduits (4/–) | 26/6 | 17/6 | 55 | 55 | 21/3 | ... | 10 7 0 |
| West, Allen (5/–) | 7/– | 4/– | 10 | 7½ | 5/– | ... | 7 10 0 |

* Dividends are paid free of Income Tax.

# CONTRACT INFORMATION

## Particulars of work for which tenders are invited, contracts placed, and building schemes promising work for electrical contractors and traders

## Contracts Open

*Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses. Further details of items marked with an asterisk can be obtained from the Department of Overseas Trade (Inquiry Room), Great George Street, London, S.W.1.*

**Aberystwyth.**—July 30th. Town Council. Electric wiring and lighting in the art room of the public library. Librarian, Public Library.

**Australia.** — BRISBANE. — August 13th. City Electric Light Co. Two outdoor oil-immersed automatic step voltage regulators. (T. 19607/40.)*

SYDNEY.—October 24th. County Council. One 50,000-kW steam turbo-alternator set for the Bunnerong power station. (T. 16057/40.)*

**Barnoldswick.**—July 31st. Electricity Department. 6.6-kV switchboard and two 500-kVA transformers. (July 12th.)

**Belfast.**—August 5th. Electricity Department. Rubber-covered conveyor belting and l.v. high-rupturing-capacity switchgear. (July 19th.)

**Gloucester.**—August 29th. Corporation. Electrical installation at new maternity hospital. (July 19th.)

**Middlesbrough.** — Borough Council. Electrical installations in public shelters in four basements and at the Regent Cinema. C. Gorman, borough engineer.

**New Zealand.** — WELLINGTON. — August 15th. Post and Telegraph Department. Twelve battery test sets. (T.Y. 20755/40.)*

August 20th. Fifty connection strips for use with bell sets, fifty press keys for telephones and 200 pressure springs for lever keys. (T.Y. 20804/40.)*

September 2nd. Copper binders and tapes. (T. 20805/40.)*

**South Africa.**—PRETORIA.—Union Tender and Supplies Board. August 29th. One bank of six l.v. switches of the air-insulated type for operation on a 380-220-V, three-phase, four-wire, 50-cycle system. (T. 20775/40.)*

August 22nd. Air conditioning plant for the new Magistrates' Courts. (T. 21013/40).* One 20-cell 250-Ah accumulator. (T. 21009/40.)* Blended lighting fittings, comprising 25 pendant bowl fittings, each to house one 125-W high-pressure mercury-vapour lamp and three 150-W tungsten filament lamps, complete with chokes and condensers. Also 60 similar fittings, except that the mercury lamp chokes and condensers are to be suitable for 80-W. (T. 21015/40.)*

August 8th. Two cold rooms in the Mental Hospital, the units to be of the ail-cooled condenser type having capacities of 4,000 and 3,500 BThU per hour respectively. (T. 20774/40.)*

September 19th. Seven electric passenger lifts, two electric goods lifts and three electric service lifts at the new G.P.O. Building, Cape Town. (T. 21012/40.)*

August 14th. Fluorescent tube lighting equipment for the Grand Hall of the City Hall. (T. 20647/40.)*

CAPE TOWN.—September 5th. Electricity Department. Thirty-two 6-ft., eight 4-ft. and 56 2-ft. double-tier heaters for the wards of the Infectious Diseases Hospital. (T. 20785/40.)*

JOHANNESBURG.—August 17th. City Council air diffusers and accessories. (T. 21010/40.)*

## Orders Placed

**Australia.** — COMMONWEALTH. — P.M.G.'s Department. Accepted. Accumulator cells.—Tudor Accumulator Co. (£445).; Exide Batteries of Australia Pty. (£1,263). Lamps, lamp caps and sockets.—Siemens (Aust.) Pty. (£1,745). Accumulator plates and separators.—Exide Batteries of Australia Pty. (£670); Tudor Accumulator Co. (£870). Dry cells and batteries.—Ever Ready Co. (Aust.) (£8,333). Instrument cords. — Reliance Electric Wire Co. (£1,479); Standard Telephones & Cables Pty. (£1,162). P.a.b.x. relay sets (£3,559) and resistances and reactances (£306).—Ericsson Telephone Mfg. Co. Relays (£465).—British G.E.C. Pty.

VICTORIA.—Railways Department. Accepted. Copper conductors.—B.I. Cables.

MELBOURNE.—City Council. Accepted. L.v. oil circuit-breakers and spares (£563).—British G.E.C. Pty.

**Brighton.**—Corporation. Recommended. Ventilating plant for Southwick power station.—Sturtevant Engineering Co.

**Eire.**—CLARE.—Mental Hospitals Committee. Accepted. Electrical equipment for the hospital (£4,326).—P. Lynch.

LETTERKENNY.—U.D.C. Accepted. Installation of electricity in seventy-nine houses (£350).—O'Hara & Co.

LURGAN.—Board of Guardians. Accepted. Electrical installation in the nurses' home of the hospital (£720).—Annesley Bros.

**London.**—ST. MARYLEBONE.—Electricity Committee. Recommended. Cables (contract extensions for three years).—Tele-

*(Continued on next page.)*

# South African Electrical Imports

## Recent Expansion Checked

IN the electrical import trade of South Africa last year there was a decline in value of about 20 per cent. compared with 1938, after a number of years of steady increase. Although competition in a number of branches of the trade was apparent from several European countries as well as the United States, the share of the United Kingdom as a whole was well maintained, and amounted to about 60 per cent. of the total. The following table has been extracted from the recently issued annual statement of the foreign trade of the Union, increases or decreases on 1938 being added:—

In addition to the items shown in the table there were imported in 1939 on Government account cable and wire to the value of £127,000; radio material (telegraph and telephone), £30,000; sundry electrical material amounting to £16,000; and electrical machinery to the value of £42,000.

| | 1939 £ (000) | Inc. or dec. on 1938 £ (000) |
|---|---|---|
| *Batteries, primary—* | | |
| Total | 49 | − 33 |
| From United Kingdom | 21 | − 7 |
| „ United States | 25 | − 25 |
| *Batteries, secondary—* | | |
| Total | 216 | + 43 |
| From United Kingdom | 61 | + 7 |
| „ Canada | 7 | + 3 |
| „ Germany | 4 | − 9 |
| „ United States | 143 | + 42 |
| *Dynamos and generators—* | | |
| Total | 99 | − 43 |
| From United Kingdom | 65 | − 53 |
| „ Germany | 4 | — |
| „ Switzerland | 11 | + 11 |
| „ United States | 16 | + 3 |
| *Motors—* | | |
| Total | 391 | −178 |
| From United Kingdom | 268 | −133 |
| „ Belgium | 2 | — |
| „ Denmark | 3 | — |
| „ Germany | 17 | − 8 |
| „ Holland | 7 | — |
| „ Sweden | 35 | − 14 |
| „ United States | 55 | − 20 |
| *Transformers—* | | |
| Total | 312 | −201 |
| From United Kingdom | 210 | −167 |
| „ Germany | 41 | − 34 |
| „ Sweden | 9 | − 2 |
| „ United States | 45 | + 6 |
| *Other electrical machinery—* | | |
| Total | 1,837 | −717 |
| From United Kingdom | 1,406 | −558 |
| „ Canada | 4 | − 11 |
| „ Belgium | 6 | + 2 |
| „ Denmark | 5 | + 1 |
| „ Germany | 89 | − 78 |
| „ Holland | 15 | + 1 |
| „ Sweden | 42 | + 27 |
| „ Switzerland | 31 | − 6 |
| „ United States | 226 | − 86 |

| | 1939 £ (000) | Inc. or dec. on 1938 £ (000) |
|---|---|---|
| *Cable and wire—* | | |
| Total | 882 | − 78 |
| From United Kingdom | 749 | − 27 |
| „ Belgium | 27 | − 2 |
| „ Denmark | 9 | − 2 |
| „ Germany | 69 | − 49 |
| „ Holland | 11 | + 5 |
| „ United States | 12 | — |
| *Heating and cooking apparatus—* | | |
| Total | 331 | + 2 |
| From United Kingdom | 93 | — |
| „ Canada | 152 | + 12 |
| „ Germany | 14 | − 10 |
| „ Switzerland | 1 | — |
| „ United States | 65 | + 4 |
| *Meters—* | | |
| Total | 41 | − 11 |
| From United Kingdom | 38 | − 9 |
| „ Germany | 2 | − 2 |
| *Vacuum cleaners—* | | |
| Total | 85 | − 19 |
| From United Kingdom | 19 | − 4 |
| „ Germany | 28 | − 13 |
| „ Sweden | 25 | + 1 |
| „ United States | 6 | — |
| *Electric hand lamps—* | | |
| Total | 25 | — |
| From United Kingdom | 1 | − 1 |
| „ Hongkong | 12 | + 2 |
| „ United States | 11 | + 1 |
| *Electric lamp bulbs—* | | |
| Total | 229 | + 26 |
| From United Kingdom | 156 | + 14 |
| „ Belgium | 13 | + 5 |
| „ Germany | 7 | − 6 |
| „ Holland | 17 | + 10 |
| „ Hungary | 11 | — |
| „ Japan | 5 | — |
| „ United States | 19 | + 3 |

| | 1939 £ (000) | Inc. or dec. on 1938 £ (000) |
|---|---|---|
| *Shades and reflectors—* | | |
| Total | 40 | − 4 |
| From United Kingdom | 16 | — |
| „ Germany | 10 | — |
| „ United States | 5 | — |
| *Self-contained electric lighting outfits—* | | |
| Total | 40 | + 1 |
| From United Kingdom | 12 | − 4 |
| „ Germany | 1 | — |
| „ Sweden | 1 | + 1 |
| „ United States | 26 | + 5 |
| *Radio apparatus and accessories—* | | |
| Total | 678 | − 52 |
| From United Kingdom | 80 | − 52 |
| „ Holland | 203 | + 45 |
| „ United States | 379 | − 36 |
| *Instruments and appliances for radio telegraphy and telephony—* | | |
| Total | 20 | − 13 |
| From United Kingdom | 17 | − 10 |
| „ Germany | 2 | − 2 |
| *Telegraph and telephone material—* | | |
| Total | 77 | − 6 |
| From United Kingdom | 50 | − 7 |
| „ Germany | 19 | + 6 |
| „ Sweden | 5 | − 3 |
| „ United States | 3 | − 1 |
| *Insulators, porcelain—* | | |
| Total | 36 | − 17 |
| From United Kingdom | 14 | − 3 |
| „ Canada | 11 | − 16 |
| „ Germany | 5 | + 3 |
| „ United States | 6 | + 3 |

graph Construction & Maintenance Co. (low-voltage); B.I. Cables (high-voltage); Enfield Cable Works (pilot and special high-voltage). Meters for another twelve months. — Chamberlain & Hookham; Ferranti.

WESTMINSTER. — Housing Committee. Accepted. Electric lighting alterations at housing estate staircases (£70).—Speedy & Eynon.

**Preston.**—Electricity Committee. Accepted. Circulating water system at Ribble power station (£151,640).—W. Moss & Son.

**West Hartlepool.**—Town Council. Accepted. Electric vehicle for the Transport Department.—Partridge, Wilson & Co.

## Contracts in Prospect

*Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.*

**Aberdeenshire.**—Public shelters (31), Peterhead, Fraserburgh, &c.; county clerk, County Buildings, Aberdeen.

**Acton.**—Factory additions; British Colloids, Ltd.

Factory additions; G. Beaton & Son, Ltd.

**Aylesbury.** — Office premises, Canal Wharf; A. Harvey-Taylor.

**Barnes.** — Communal shelters, Mortlake, &c.; borough engineer, Council House, High Street, S.W.14.

**Batley.**—Extensions to dye works for J. & J. Longbottom; S. B. Nelson, contractor, Birstall, near Leeds.

**Bedlington.**—Basement shelters; W. Hall, U.D.C. surveyor.

**Bristol.**—Cleansing stations (£6,420), and shelters at Stapledon Institution (£3,000); City Engineer's Department, 63, Queen Street.

**Bromsgrove.**—Improvements to theatre and laundry kitchen departments of the Bromsgrove, Droitwich and Redditch Joint Hospital (£2,676); S. N. Cooke, architect, Sun Buildings, Bennett's Hill, Birmingham.

**Brownhills.**—Auxiliary fire stations, for U.D.C.; Norman Waine, clerk, Council Offices, Brownhills, Staffs.

**Clutton** (SOMERSET).—Fire station for R.D.C.; building surveyor, Council Offices, Temple Cloud.

**Cockermouth.**—Public shelters; U.D.C. surveyor.

**Collyhurst.**—Additions to offices for Packing Materials Association, Ltd.; F. Hill, architect, 11, Tenterden Street, Bury.

**Coventry.**—Houses, Brayford Avenue, for A. H. Coltman & Son, 143, Barker Butts Lane.

Houses, Blackwatch, Owenford and Middlewich Roads, for Breeze and Burt, Ltd., Cheverall Lane; T. D. Griffiths, architect, 3, The Quadrant, Coventry.

Houses, Tonbridge Road and London Road; A. J. Aston.

Canteen for the Daimler Co.; Higgs & Hill, Ltd., contractors, Crown Works, South Lambeth Road, London, S.W.8.

Extensions to offices for Sterling Metals, Ltd.; F. G. Plumb & Sons, Ltd., contractors, 29, West Orchard Street, Coventry.

Works additions; S. Gill & Sons.

Extensions to works; Unbrako Socket Screw Co., Ltd.

**Crewe.**—Houses; L. Reeves, borough engineer and surveyor, Municipal Buildings, Crewe.

**Croydon.**—Factory extensions; S. & R. J. Everett.

**Durham.**—Completion of Billingham North School, additions to Easington Colliery Senior School, alterations to East Stanley School and remodelling of Flint Hill School and Workshops at Technical College; F. Willey, county architect, 34, Old Elvet, Durham.

Shelters at another 25 schools; county architect.

**Easington.** — Public shelters; R.D.C. surveyor.

**East Ham.**—Further school shelters (£2,220); borough engineer, Public Offices, Town Hall, E.6.

**Edinburgh.**—Air raid shelters (24) for University Court; principal.

Mission Hall at Boswall Parkway for trustees of Council of Diocese of Edinburgh of the Episcopal Church; the Bishop, Edinburgh.

Pattern making shop, &c.; Bruce Peebles & Co., Ltd.

**Evesham.**—Houses, Rous Lench, for R.D.C.; R. J. Atkinson, surveyor, 64, Port Street.

**Hebburn-on-Tyne.**—Shelters for U.D.C.; J. Dibble, U.D.C. offices, Hebburn, Co. Durham.

**Hinckley.**—Additions to premises, Barwell; Barwell Co-operative Society, Ltd.

**Hyde.**—Extensions to works; I.C.I. (Rexine), Ltd.

**Leicestershire.** — School shelters (£10,000); county architect.

**Lincolnshire.** —Hutted extensions to police buildings for C.C.; county architect, County Offices, Newland, Lincoln.

**Longbenton.**—Communal shelter, Dudley estate; U.D.C. surveyor.

**Macclesfield.**—Houses for agricultural workers; J. H. Walters, engineer and architect, Moody Chambers, Congleton.

**Manchester.**—Additions to canteen for Samuel Marsden & Sons, Ltd.; H. S. Fairhurst & Son, architects, 55, Brown Street.

Reception depôt for haulage vehicles for Hauliers, Ltd.; J. Fitzsimmons, architect, 94, Shudehill.

Alterations and additions to mill for Hollands, Ltd.; T. Hayes, architect, 10, Clegg Street, Oldham.

Additions to the Good Shepherd Convent, Chain Road, Blackley; Hill, Sandy & Norris, architects, 9, Albert Square.

Additions to shops and showrooms for C. & A. Modes, Ltd., Oldham Street; Samuel Elliott & Sons (Reading), Ltd., contractors, Caversham, Reading.

New fracture unit at the Withington Hospital; G. Noel Hill, city architect.

**Middlesbrough.**—Air-raid shelter at the Remand Home; J. E. Shipley & Son, builders, Middlesbrough.

Air-raid shelter for Winterschladen & Co.; Thomas Crawford, architect, 82, Borough Road, Middlesbrough.

**Morecambe and Heysham.**—School, Wesley Drive, for the Heysham Wesleyan Church trustees; Wm. Huddleston & Son, contractors, 46, Back Sefton Road, Morecambe.

Laboratory, &c.; A. Robinson & Son, contractors, Westfield Works, West End Road, Morecambe and Heysham.

**Morley.**—Rebuilding "Fleece" Inn, Troy Road, for Truman, Hanbury, Buxton & Co., Ltd., The Brewery, Derby Street, Burton-on-Trent; Pennington, Hustler & Taylor, architects, 60, Wellington Street, Leeds, 1.

Extensions to foundry for R. Hudson, Ltd.

Bungalows for J. Dean, Thorpe Lane, West Ardsley.

Additions to works for water-softening plant for J. & D. Brook, Ltd.

**Morpeth.**—Shelters at Children's Homes for the Central Guardians Committee.

**Newcastle-on-Tyne.** — Alterations and additions to the City Hospital for Mental Defectives (£6,200); E. Thompson, builder, 12, Grey Street, Newcastle.

**North Cotswold.** — Houses (44), in eleven parishes, for R.D.C.; J. E. Busfield, surveyor, Council Offices, Moreton-in-Marsh.

**Plymouth.**—Factory extensions; Sulfuro Fertilisers, Ltd.

**Redditch.**—Houses on the Greenlands Farm Estate; L. O. Wilkes, surveyor, The Council House.

**Richmond** (SURREY).—Grouped surface shelters in seven areas (744 persons); Borough Engineer's Office, Hotham House, Heron Court, Richmond, Surrey.

**Rusholme.**—Conversion of Repertory Theatre into cinema, for The New Grosvenor, Ltd.; H. H. Yearsley, architect, 7, Oxford Road, Ardwick, Manchester.

**Ryton-on-Tyne.**—Air-raid shelters; J. Dalton, U.D.C. offices, Ryton-on-Tyne.

**Shropshire.**—Further school shelters (£20,000); county architect.

**Somerset.** — Air-raid protection for schools (£9,000 to £10,000), for C.C.; R. O. Harris, county architect, Park Street, Taunton.

**Southport.**—Shelters at various hospitals, for T.C.; R. E. Perrins, town clerk, Town Hall.

**Southwell** (NOTTS).—Fire station (£6,200), for R.D.C.; John Ellis, clerk, 8, Westgate, Southwell.

**Staffordshire.**—Technical college, Walsall, for E.C.; G. C. Lowbridge, education architect, County Offices, Stafford.

**Stretford.**—Additions; Trussed Concrete Steel Co., Ltd.

**Tarvin.** — Houses for agricultural workers; T. Pritchard, surveyor, Westminster Buildings, Newgate Street, Chester.

**Taunton.**—First-aid station, &c.; Harding, Tilton & Hartley, Ltd.

**Torrington.**—Shelters; R. W. C. Kingsley, borough surveyor.

**Urmston.**—Laboratory, &c., for the Superheater Co., Ltd.

**Wakefield.**—Pavilions adjoining the White Rose County Hospital; S. Hutton, city engineer and surveyor, Town Hall.

**West Ham.** — Communal shelters; borough engineer, Town Hall, West Ham, E.15.

**Wolverhampton.** — Pumping station; borough engineer, Town Hall.

## Undertakings Results

### Walsall

SURVEYING the position of the Walsall undertaking, Mr. E. A. Newburn, engineer and manager, takes a reassuring view of the prospects. It has happily not been found necessary to increase charges or to operate the coal clause in bulk supply agreements, and Mr. Newburn sees no reason to think that any general increase in the tariff will be necessary in the near future.

During the past year the reduction in lighting sales due to the black-out was offset by the expansion in industrial power supplies and by the greater use of electric heating during the cold spell which, fortunately, this year did not seriously increase the system maximum demand. The resulting growth in total sales was 15.3 per cent. compared with 9.8 per cent. in the previous year.

Excluding supplies to other authorised undertakings, altogether 54.1 million kWh was sold. Load factor, at 37.3 per cent., was the best recorded during the past decade, and compares with 33 per cent. in 1938-39. Consumers at the end of March last numbered 30,807, an increase of 1,400.

As a result of the year's working there was a net profit of £31,055 (compared with £35,812), of which £6,823 goes to rate relief, £1,111 to reserve, and £4,863 for capital expenditure out of revenue, leaving £18,258, which increases the carry-forward to £34,987.

### Burton-on-Trent

Another undertaking which has so far found it possible to avoid raising its charges is that at Burton-on-Trent. Present tariffs are low—in the last seven years the average price charged has been reduced from 1.36d. to 0.996d., which has been reflected in the rapid growth in sales. But for the war, Mr. T. Hall, the borough electrical engineer, considers that additional business in the sale, hire and hire-purchase of appliances would have reached record proportions. As it is, he reports that business previously secured has been maintained and there have also been reasonable increases in the connection of all types of appliances.

Excluding the bulk supply to Uttoxeter, sales aggregated 54.0 million kWh, an increase of 15.7 per cent. over 1938-39, and there was an improvement in load factor from 36.71 to 37.74 per cent. The number of consumers rose by 823 to 25,832. There was a net profit for the year of £22,222 (against £17,435) and after allocating £5,000 to rate relief, providing £4,421 for capital expenditure out of revenue, and placing £2,831 to reserve the balance carried forward is increased to £34,472.